A STUDY ON
AZHAL KEEL VAYU
(Osteoarthritis)

Dissertation Submitted To

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For the Partial fulfillment for the Award of Degree of

DOCTOR OF MEDICINE (SIDDHA)

(Branch – III, SIRAPPU MARUTHUVAM)

DEPARTMENT OF SIRAPPU MARUTHUVAM

Government Siddha Medical College

Palayamkottai – 627 002.

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PALAYAMKOTTAI, TIRUNELVELI-627002,
TAMILNADU, INDIA.

Phone: 0462-2572736 / 2572737/ Fax:0462-2582010
Email: gsmc.palayamkottai@gmail.com

BONAFIDE CERTIFICATE

This is to certify that the dissertation entitled **"A STUDY ON AZHAL KEEL VAYU** is a bonafide work done by **Dr. R. VIKNESHWARI, (Reg No: 321513010) GOVERNMENT SIDDHA MEDICAL COLLEGE, PALAYAMKOTTAI** in partial fulfillment of the University rules and regulations for award of **M.D (SIDDHA), BRANCH - III SIRAPPU MARUTHUVAM** under my guidance and supervision during the academic year **2015-2018 OCTOBER.**

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TAMILNADU, INDIA.

Phone: 0462-2572736 / 2572737/ Fax:0462-2582010
Email: gsmc.palayamkottai@gmail.com

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I hereby declare that this dissertation entitled **"A STUDY ON AZHAL KEEL VAYU"** is a bonafide and genuine research work carried out by me under the guidance of **Dr. M.AHAMED MOHIDEEN, M.D(s).,** Associate Professor, PG- III, Department of Sirappu Maruthuvam, Govt. Siddha Medical College, Palayamkottai and the dissertation has formed the basis for the award of any Degree, Diploma, Fellowship or other similar title.

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Place: Signature of Candidate

Dr. R.Vikneshwari

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III	Sirappu Maruthuvam	Prof.Dr.A.S.Poongodikanthimathi MD(S)	
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PALAYAMKOTTAI-627002

TAMILNADU,INDIA

Ph: 0462-2572736/2572737/fax:0462-2582010

Email id :gsmc.palayamkottai@gmail.com

CERTIFICATE OF BOTANICAL AUTHENTICITY

Certified the following plant drugs used in siddha formulation **KANDATHIRI LEGHIYAM (INTERNAL) & NAKKA PUSA MUKKUTTENNAI (EXTERNAL)** for management of **AZHAL KEEL VAYU (OSTEO ARTHRITIS)** taken up for post-graduation dissertation studies by **Dr.R.VIKNESHWARI M.D (S). ,(REG.NO:321513010)** PG scholar, department of sirappu maruthuvam are correctly identified and authenticated through Visual inspection / Organoleptic characters / Experience, Education & Training morphology, microscopical and taxonomical methods.

INGREDIENTS OF KANDATHIRI LEGHIYAM

S.NO	DRUGS	BOTANICAL NAME	FAMILY	PART USED
1	Ingi	Zingiber officinale	Zingiberaceae	Rhizome
2	Kandangathri	Solanum surattense	Solanaceae	Stem,leaf,root
3	Mullangi	Raphanus sativus	Brassicaceae	Rhizome
4	Neringil	Tribulus terrestris	Zygophyllaceae	Stem,leaf,root
5	Elumichai	Citrus limon	Rutaceae	Fruit
6	Chukku	Zingiber officinale	Zingiberaceae	Rhizome
7	Milagu	Piper nigrum	Piperaceae	Unriped fruit
8	Vaivilangan	Embelia ribes	Myrsinaceae	Seed
9	Seeragam	Cuminum cyminum	Apiaceae	Fruit
10	Elam	Elettaria cardamomum	Zingiberaceae	Fruit
11	Thippili	Piper longum	Piperaceae	Fruit
12	Kirambu	Syzygium aromaticum	Myrtaceae	Flower bud
13	Thalisapaththiri	Taxus baccata	Taxaceae	Leaf

INGREDIENTS OF NAKKA PUSA MUKKUTTENNAI

SL.NO	DRUGS	BOTANICAL NAME	FAMILY	PART USED
1	Notchi	Vitex negundo	Verbenaceae	Leaf
2	Erruku	Calotropis gigantea	Asclepiadaceae	Leaf
3	Puli	Tamarindus indica	Caesalpiniaceae	Leaf
4	Kunthirikkam	Vateria indica	Diptherocorpaceae	Resin
5	Manjal	Curcuma longa	Zingiberaceae	Rhizome

Station:

Date:

Authorized Signature

Dr. S. SUTHA, M.Sc.,M.Ed.,Ph.D.,
Associate Profes
Dept. of Medicin
Govt. Siddha Medica College
Palayamkottai, Tirunelveli - 2.

The Tamil Nadu Dr.M.G.R.Medical University

69, Anna Salai, Guindy, Chennai - 600 032.

This Certificate is awarded to Dr/Mr/Mrs..... VIKNESHWARI.R .....

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International Day of Yoga 21 June

Yoga for Harmony & Peace

Prof.**Dr. A.S. Poongodi Kanthimathi** M.D (Siddha).,
Head - Department of Sirappu Maruthuvam.

Prof. **Dr. R.Neelavathy** M.D (Siddha)., Ph.D.,
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Prof.**Dr. A.S. Poongodi Kanthimathi** M.D (Siddha).,
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IAEC APPROVAL CERTIFICATE

This is to certify that the project **Evaluation of Antiinflammatory, Analgesic And Toxicological Profile of Kandathiri Legiyam** has been approved by the IAEC, KMCH College of Pharmacy, Coimbatore.

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A. Rajasekaran

Dr. A. Rajasekaran
Biological Scientist and IAEC Chairperson
PRINCIPAL
KMCH College of Pharmacy,
Kovai Estate, Kalapatti Road
Coimbatore - 641 048.
Tamil Nadu, INDIA

KMCH College of Pharmacy * Coimbatore - 641 035

17/2/18

Dr. D. Kannan
Main Nominee [CPCSEA]

INSTITUTIONAL ETHICAL COMMITTEE
GOVERNMENT SIDDHA MEDICAL COLLEGE, PALAYAMKOTTAI
TIRUNELVELI – 627 002
TAMIL NADU INDIA

Ph : 0462-2572736 / 2573737 / 2582010 Fax : 0462-2582010
Email ID : gsmc.palayamkottai@gmail.com

F.No.GSMC / 5676 / P&D / Res / IEC / 2014 **Date : 20.07.2016**

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Address of Ethical committee	Government Siddha Medical College Palayamkottai – 627002 Tirunelveli District
Principal investigator	Dr.R.Vikneshwari. I Year, PG Dept of Sirappu Maruthuvam Reg.No :
Guide	Dr.M.Ahamed mohideen.M.D(s) Reader Dept of sirappu maruthuvam
Dissertation topic	An open clinical Study to evaluate the clinical efficacy of siddha sasthric formulation **"KANDATHIRI LEGIYAM"**(Internal)**"NAKA PUSA MUKKUTTENAI"**for the treatment of **AZHAL KEEL VAYU**
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Clinical / Non Clinical trial Protocol	Clinical trial protocol – Yes
Informed consent document	Yes
Any other document	Case sheet, Investigation document
Date of IEC approval & it's Number	GSMC/3.IEC/2016/III-29/20.07.16

We approve the trial to be conducted in its presented form.

The Institutional Ethical committee expects to be informed about the process report to be submitted to the IEC at least annually of the study, any SAE occurring in the course of the study and changes in the protocol and submission of final report.

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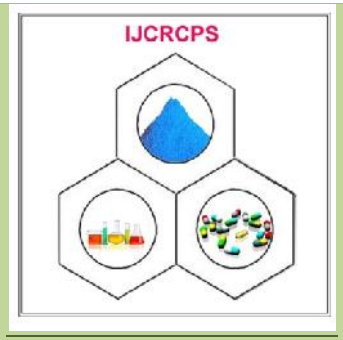

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[1, 2] PG scholar, Department of PG Sirappu Maruthuvam, Govt. Siddha Medical College, Palayamkottai, Tamil nadu India.

[3] Professor & HOD, Department of PG Sirappu Maruthuvam, Govt. Siddha Medical College, Palayamkottai, Tamil nadu India.

[4.]Grade II lecturer, Department of PG Sirappu Maruthuvam, Govt, Siddha Medical College, Palayamkottai, Tamil nadu India.

[5.]Grade II lecturer, Department of PG Sirappu Maruthuvam, Govt. Siddha Medical College and Hospital, Palayamkottai, Tamil nadu India.

Corresponding authors: Dr.K.Elakkiya, PG scholar, Department of PG Sirappu Maruthuvam, Govt. Siddha Medical College, Palayamkottai, Tamil nadu, India. E- mail: drsfelaks@gmail.com

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[1,2] PG scholar, Department of PG Sirappu Maruthuvam, Govt. Siddha Medical College and Hospital, Palayamkottai, Tamil nadu, India.

[3.] Professor & HOD, Department of PG Sirappu Maruthuvam, Govt. Siddha Medical College and Hospital, Palayamkottai, Tamil nadu, India.

[4.] Associate Professor, Department of PG Sirappu Maruthuvam, Govt. Siddha Medical College and Hospital, Palayamkottai, Tamil nadu, India.

[5.] Grade II Lecturer, Department of PG Sirappu Maruthuvam, Govt. Siddha Medical College and Hospital, Palayamkottai, Tamil nadu, India.

Corresponding author: Dr. Vikneshwari R, PG scholar, Department of PG Sirappu Maruthuvam , Government Siddha Medical College, Palayamkottai Tamil nadu, India E-mail: *valgavalamudan1124@gmail.com*

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Dr. N.S. NEKI
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INTRODUCTION

Siddha system is one of the unique systems of Indian medicine. Siddhars are believed to be the founders of siddha medicine. They handles the herbs, minerals, to prepare the medicine.

Significantly one the definitions off the siddha medicine is invasion of death “that which ensures preventive against mortality” –Thirumoolr.

The aim of the every system of medicine is to give healthiness to an individual. But siddha system is distinguished from other system because it gives both mental and physical health.

On the basis of our siddha text Osteoarthritis is inter correlated with keelvayu and more often keel vayu comes under 80 types of vadha diseases. In Yugi vaithiya chinathamani-800 one among them is “AZHAL KEEL VAYU”.

Osteoarthritis is a chronic degenerative disorder of multi factorial etiology characterized by loss of articular cartilage, hypertrophy of bone at the margins, subchondral sclerosis and range of biochemical and morphological alterations of the synovial membrane and joint capsule. Typical clinical symptoms are pain, particularly after prolonged activity and weight bearing; whereas stiffness is experienced after inactivity.

Primary Osteoarthritis is mostly related to aging. It can present as localized, generalized or as erosive osteo arthritis. Secondary osteoarthritis is usually followed by another disease. It is the second most common rheumatological problem and it is the most frequent joint disease with prevalence of 22% to 39% in India. Osteoarthritis the most common form of arthritis is a major contributor to functional impairment and reduced independence in older adults.

Among the 100 different types of arthritic conditions osteoarthritis is the most common, affecting 25 million people. Osteoarthritis more frequently as the age increased. Before age 45, Osteoarthritis more frequently in males, and after 55years of age, it occurs more frequently in females.

A variety of cause’s hereditary, developmental, metabolic and mechanical deficits may initiate processes leading to loss of cartilage. When bone surfaces become less protected by cartilage, bone may be exposed and damaged. As a result of decreased movement secondary to pain, regional muscles and ligaments may atrophy. When the severity increases, invasive treatment may be needed.

The author have selected the KANDATHIRI LEGHIYAM (Internal) to evaluate their therapeutic efficacy in the treatment of Azhal Keel Vayu (OSTEOARTHRITIS) as above said drug formulation has not undergone any clinical so far.

Internal Medicine

KANDATHIRI LEGHIYAM -Agathiyar vaithiya Soorthiram 650 (Page No. 161).The dosage of the trail medicine is 6gms (BD) for 48 days.

External Medicine NAKKA PUSA MUKKUTTENNAI-Yughimuni Vaithiya kaviyam(Page no.37) with the dosage -60ml (for external application)

The above medicine contains ingredients which have anti vadha property. Considering this they are chosen as trial medicines in this study. Varmam, and asanas are one of the best external therapies in Siddha system of medicine and the effectiveness of varmam and asanam in alleviating pain in Azhal Keel Vayu is also evaluated along with trial medicines.

AIM AND OBJECTIVE

AIM:

To Evaluate the clinical efficacy of **"KANDATHIRI LEGHIYAM "** (internal) and **"NAKKA PUSA MUKKUTTENNAI"**(external) for the treatment of Azhal Keel Vayu (OSTEOARTHRITIS).

Primary objective :

To evaluate the clinical efficacy of **"KANDATHIRI LEGHIYAM "** (internal) and **"NAKKA PUSA MUKKUTTENNAI** (external) for the treatment of Azhal Keel Vayu (OSTEOARTHRITIS).

Secondary objective:

- To study the Siddha basic principles like envagai thervukkal including neerkkuri and neikkuri.
- To evaluate the safety profile of the trial medicine.
- To Evaluate the pharmacological study of trial medicine

REVIEW OF LITERATURE

SIDDHA ASPECT

According to our siddha literature the disease occur due to the variation of three humours namely vatham, pitham, kabam.

Thiruvalluvar says

"மிகினும் குறையினும் நோய் செய்யும் நூலோர்
வளிமுதலா எண்ணிய மூன்று".

Three humours theory

The three 'humors' as described in siddha medicine is a golden line continuous in physiology, pathology and treatment. The three humours vatham, pitham and kapham, whose balance is essential for maintenance of good health.

"வாதமாய் படைத்து பித்த வன்னியாய் காத்து சேத்ம
சீதமாய் துடைத்து"

- தேரையர் மருத்துவ பாரதம்

Similarly a day is divided into three phases or parts and each part is said to be prominent phase of vatha, pitha and kaba. In the human body vatha exists below the naval, pitha between the heart and naval and kapha above the heart, When the three humours are in equilibrium they are called as "UYIR THATHU". While they are getting deranged they are called kutras or Doshas. There may be small fluctuation in physiological condition even in the healthy body.

The normal order of vatha, pitha, kaba is in proportion of 1: ½: ¼ respectively.

வழங்கிய வாதம் மாத்திரை யொன்றாகில்
தழங்கிய பித்தம் தன்னிலைரவாகி
அழங்குங் கபந்தானடங்கியே காலோடில்
பரங்கிய சீவர்க்கு பிசகொன்று மில்லையே

Any changes in these proportions will be responsible for disease but the maintenance of their normal proportion gives vitality to the organism and assures the preservation of health and longevity of life.

Thannilai valarchi

(Accumulation and excitation)

- The stage where the humour accumulates in a particular part as stagnant is called Thannilai valarchi.

- When the stagnant humour accumulated and permeated a structure there is an excitement from eversion towards similar and attraction towards contraries. This is known as “Prakobam”.

Piranilai Valarchi (Spreading)

This is the stage where the excited humour extends by viyana to another part. The derangement of kutram becomes located in parts of the body. And being to cause disease of joints, blood, stomach, bladder and soon.

I. Vatham

The term vatha denotes

- Vayu
- Dryness
- Pain
- Flatulence and
- Lightness

Location of vatham

Vatham is located in the hip, below the abdomen, moolatharam and sexual organs. It is also said that vatha is settled in various places including bone, joints, nerves, vessels, hair follicles, muscles, sperm, urine and stools.

Funtion of vatham

The function of vatha is stimulates the body and soul, voiding of excreta refreshesness and proper harmony of the seven thathu.

Effects of vitiated vatha

Vayu -pain, exquisite pain, extreme dryness, palpitation, dislocation of the joints, dysfunction of the sexual organs, constipation, dysuria, thirst, pain in the long bone. Unable to flexion and extension of the limbs, dark complexion and emaciation are the main ill effects of the vitiated vatha.

II. Pitham

The term pitham denotes gastric juice, bile, energy, heat and anger etc.

Location of pitha

Head, heart, bladder, abdomen, umbilicus, stomach, saliva, sweat, blood, eyes and skin are the sites of pitham.

Effects of vitiated pitham

Excessive heat in the body, improper digestion, excessive sweat, giddiness, syncope and immortal behaviours are some of the ill effects of vitiated.

III.Kabam

Location of kabam

The kabam is located in the tongue, chest, blood, bone marrow, bones, nerves, brain, large intestine, eyes and joints.

Functions of kabam

The important functions of kabam are maintaining the unctuous and viscosity and proper functioning of the joints.

Effects of vitiated kabam

Pain in the long bones, dysfunction of the joints, improper digestion, excessive sleep and inhibition of understanding capacity.

Suvai

The food we eat has six tastes namely

- Inippu
- Pulippu
- Uvarppu
- Kaippu
- Kaarppu
- Thuvarppu

Each of it is a mixture of two basic elements

Inippu	-	Mann + Neer
Pulippu	-	Mann + Thee
Uvarppu	-	Neer + Thee
Kaippu	-	Kaatru + Aagayam
Thuvarppu	-	Mann + Aagayam
Karppu	-	Kaatru+ Thee

Panchapootha theory

The five elements Aagayam, kaatru, thee, neer, mann are the basis for the world and the human being. These five elements are subtle states (Sookuma nilai). They manifest into a gross state (Sithula nilai) and become visible. the manifestations of the five elements from the subtle state to gross are called as panchapootha panchi karanam.

Panchapoothas are the foundations for thiridhosas which are the pillars that support our body structure.

- Vayu constitute vatham
- Theyu constitute pitham
- Appu constitute kabam

Relation between suvai, Panchapootham and Thiridhosam

S.No.	Suvai	Panchapootham	Thiridhosam
1.	Inippu	Mann + Neer	Kabam ↑ Vatham ↓(-) Pitham ↓(+)
2.	Pulippu	Mann + Thee	Kabam ↑ Pitham ↑ Vatham ↑ (-)
3.	Uppu	Neer + Thee	Kabam ↑ Pitham ↑ Vatham ↑ (-)
4.	Kaippu	Vayu + Aagayam	Vatham ↑ Kabam ↓(-) Pitham ↑ (-)
5.	Kaarppu	Vayu + Thee	Vatham ↑ Pitham ↑ (-) Vatham ↓(-)
6.	Thuvarppu	Mann + Vayu	Vatham ↑ Kabam ↓ Pitham ↑ (-)

↑ - Vetrunilai valarchi

↓ - Thannilai valarchi

(-) - Thannilai Adaithal

KEEL VAYU

Other names

According to siddha maruthuvam textbook Keel vayu mentioned as

- Santhu vali,Muttu vali,Megha soolai,Mudakku vayu,Ama vatham
- Vitiated vatham produces disease in Keel (joints) called as -"Keel vayu".
- Pain in muttu (Joint) called as -"Muttuvali"
- Disease which followed by megha noi called as -"Megha soolai"
- Inability to use joints properly called as -"Mudakku vayu".
- Pain present in all joints called as -"Santhuvali".
- Improper digestion of food followed by increased kapham produces vadha disease called as -"Amavatham".

In yakobu vidya sinthamani it is mentioned a "Mudakku vatha soolai". In Thanvanthri vaidya kaviyam it is said as "Mudakku vayu".

Iyal (Definition)

Keel vayu is a vatha disease characterized by pain and swelling of the joints, stiffness of the muscles and joints with tenderness frequently associated with fever, anorexia and insomnia. It may be accompanied by emaciation, anaemia and restriction of joint movements and in some cases even immobility may occur.

According to agasthiar guna vagadam "Keel vayu" comes under the 80 types of vatha disease

"வலியு மையுந் தன்னிலை கெட்டு
வலியுடன் வீக்கச் சுரமும் காய்ந்து
முட்டுக டோறும் முடுக்கியே நொந்து
முட்டுக டன்னின் நீரும் சுரந்து
தாங்கொணா வலியுடன் நொந்திடு மம்மே"

\- சபாபதி கையேடு

"தானாக கீல்வாத ரோகம் பேரை
நோய் தனக்கு பாகியாய் வாதரோக மென்பார்
நுட்பமுள்ள வாதரோக மென்பதுந் தான்
ஆய்ந்தெடுத்து இதற்குள்ளே அடக்கம் பாரு"

\- அகத்தியர் குணவாகடம்

- "Keel vayu" is further divided into 10 types in the text siddha maruthuvam according to sabapathi manuscript.
- Azhal Keel vayu comes under these 10 subdivisions of Keel vayu.

When vatha vitiated, diet and habits which stimulates pitha it will produce "Azhal Keel vayu".

- Azhal means pitham
- Keel means joint
- Vayu means vatham

Noi Enn (Classification)

Keel vayu is classified into 10 types according to siddha maruthuvam textbook.

- Vali Keel vayu
- Azhal Keel vayu
- Iya Keel vayu
- Vali azhal Keel vayu
- Vali iya Keel vayu
- Azhal vali Keel vayu
- Azhal iya Keel vayu
- Iya vali Keel vayu
- Iya azhal Keel vayu
- Mukkutra Keel vayu

In theraiyar vagadam among the 81 vatha diseases following are joint diseases.

- Sooriya vatham
- Seetha vatham
- Mozhi vatham
- Kuthi vatham
- Santhu vatham
- Vasi vatham
- Kendai vatham
- Sathi vatham
- Thombai vatham
- Kotai vatham

In the text Athma rakshamirtham, the following are described as joint diseases

- Muzhanthai vatham
- Mudakku vatham
- Kendaikal vatham
- Santhu vatham
- Thoal vatham
- Muzhi vatham

Noi varum vazhi (Aetiology)

According to siddha medicine, causes of disease are due to the disturbance of thathus and they are attributed in the internal and external causes. The internal causes are constitutional or karma rohams. The external causes bring up direct from the disturbance of food and environment

External cause

Environmental factors

"வாதவர்த் தன காலமேதோ வென்னில்
மருவுகின்ற ஆனி கற்கட மாதம்
ஆதனைப் பசியோடு கார்த்திகை தன்னில்
அடருமே மற்ற மாதங்கள் தன்னில்
போகவே சமிக்கின்ற காலமாகும்

- யூகி சிந்தாமணி

The vatha disease will be precipitated in the months from Aani to karthigai (June to December)

"பதுமத்தைப் பூக்க வைக்கும் பானுமிகக் காயும்
முதுவேனி லிற்பு விந்நீர் முற்றும் - கதுமென
வற்றும் கபம∴கும் வாயுமிகும் வாழ்மாந்தர்க்
குற்ற நலிக் கேதிதென் றோது".

- சித்த மருத்துவாங்க சுருக்கம்

In Muthuvenil kaalam, the increased solar radiation increases the evaporation of water content in the world, on the same time this similar action on the body produces increases absorption of mucous for digestion and develops the vitality of vatha disease. So this disease occurs predominantly in Muthuvenil kaalam.

Diet

"வளிதரு காய் கிழங்கு
வரைவிலா தயிலல் கோழை
முளிதயிர் போன்மிகுக்கு
முறையிலா வுண்டி கோடல்
குளிர்தரு வளியிற் றேகங்
குளிப்புற வுலவல் பெண்டிர்
களித்தரு முயக்கம் பெற்றோர்
கடிசெயல் கருவியாமல்"

Diet and health which gives rise to vatha dhosa (ie) excessive intake of potato like roots and banana, excessive intake of cold substances like curd, exposure to cold, staying in hill station which increase kabam causes this disease. Further this disease is followed by megha noi and may be hereditary.

Physical factors

"பகரவே வாதமது போகித்தப்போ
பண்பாக பெண்போகம் அதுதான் செய்யில்
தகாவே வெகுதூர வழிநடக்கில்
நளிரான காற்றுமே பனிமேல் பட்டால்
நிகரவே காய்கள் கனிகிழங்கு தன்னை
மிக வருந்தி மீறியே தயிர்தான் கொண்டால்

முகரவே முதுகெலும்பை முறுக்கி நொந்து
முழங்காலும் கணுக்காலும் கடுப்புண்டாகும்.

- யூகி சிந்தாமணி

Indulging in the sexual act during vitiation of vatha, walking for a long distance, exposing to dampness and cold, harmful combination like taking excessive curd after eating fruits, vegetables and tubers causes toxic factors which affects bone and muscle.

"தானென்ற கசப்போடு துவர்ப்பு கைப்பு
சாதகமாய் மிஞ்சுகினும் சமைத்த வன்னம்
ஆனென்ற ஆறினது புசித்த லானும்
ஆகாயத் தேறலது, குடித்தலாலும்
பானென்ற பகலுறக்க மிராவிழிப்பு
பட்டினியெ மிகவுறுதல் பாரமெய்தல்
தேனென்ற மொழியார் மேற்சிந்தை யாதல்
சீக்கிரமாய் வாதமது செனிக்குந்தான

- யூகி சிந்தாமணி

Intake of food item which are excess bitter, astringent and pungent tastes, intake of old cookded food items, drinking rain water, sleeping during day time and wakening at night, undue starving, strain due to excessive weight lifting and sexual perversion.

According to Pararasa sekaram

தொழில் பெறுகைப்புக் கார்த்தல் துவர்த்தல் விஞ்சுனுஞ்சோறும்
பழையதாம் வரகு மற்றைப் பைந்தினையருந்தினாலும்
எழில் பெறப் பகலுறங்கி இரவினிலுறங்காதலாலும்
மழை நிகர் குழலினாலே வாதங்கோ பிக்குங்காணே

Excessive intake of bitter, astringent, pungent taste diet, day sleeping, wakening during night intake of old cooked food items.

காலங்களின் மாறிபுண்ணும் காரியத் தாலுந்தண்ணீர்
சாலவே யருந்தினாலுஞ் சந்தியி லுட்கார்ந்தாலும்
கோலமாம் புளிப்பு நெய்யைக் குறைவற வநருந்தினாலும்
வாலார் முலைநல்லாளே வாதமுதற் பவிக்குங்காணே

Sitting in cold breeze, excess intake of sour and ghee in food items.

In theraiyar vagadam

வெய்யிலில் நடக்கையாலும் மிகத்தண்ணீர் குடிக்கையாலும்
செய்யிழை மகளிரைச் சேர்ந்தன பவிக்கையாலும்
பையனே உண்மையாலும் பாகற்காய் தின்கையாலும்
தையலே வாதரோகம் சனிக்கு மென்றறிந்து கொள்ளே.

- தேரையர் வாகடம்

Excessive walking in hot sun, excessive intake of water, over sexual indulgence, intake of bitter gourd etc. May play a disturbing role in the normal functions of vatham.

Internal causes

Kanma as a cause

In siddha system, many diseases are said to be precipitated by kanma, which means the deeds, good or bad committed by an individual in his previous and present births. Vatha diseases, according to agasthiyar kanma kandam – 300 may also precipitated by kanma.

Vadha kanma varalaru

நூலன்ற வாதம் வந்த வனகதானேது
துண்மையாய்க் கன்மத்தின் வகையைக் கேளு
காலிலே தோன்றியது கடுப்பதேது
கைகாலில் முடக்கியது வீக்கமேது
கோலிலே படுகின்ற விருட்சமான
குழந்தை மரந்தனை வெட்டல் மேல் தோல் சீவல்
நூலிலே சீவ ஐந்து கால் முறித்தல்
நல்ல கொம்பு தழைமுறித்தல் நவித்தல் தானே

- அகத்தியர் கன்ம காண்டம்

If attribute the following psychological factors such as removing the bark of living trees, breathing the legs of the animals, cutting the trees in the living branches and removing leaves.

Due to karmic law

அந்தணர் கற்பு மாதர் அருளிய சாயத்தாலும்
முந்திய வினையாலும் முகிர்கர்ப்ப மேகத்தாலும்
சிந்தையிற் கொடுமையாலும் சிவகுரு நிந்தையாலுந்
தொந்தமாம் வியாதியாலும் தோன்றிடும் குலைதானே.

- அகத்தியர்

Clinical features

"பித்தக்கீல் வாய்வு தன்னாற்
பிறங்குகீள் மூட்டு வீங்கிச்
சித்தர்செய் மருந்து வத்துஞ்
சீர்படாத் தன்மைத் தாகித்
தத்தறு காய்ச்சல் கண்டு

சாலவே தனைதான் தந்தே
மெத்தறு சிகிச்சை தன்னால்
மென்மேல் நீங்கு மப்பா"

- சபாபதி கையேடு

- Swelling of the joint
- Fever
- Restricted movement
- Swelling of the joints will increased day by day. Increased pitham act as synovid theid between the joint space which dries it. It makes sound like "Kaluk, kaluk". when the movement of the joint.
- Sometimes it may cause inability to move the joints.

MUKKUTRA VERUBADUGAL

In azhal Keel vayu the following vayus are affected

Vatham

S.No.	Vatham	Physiological function	Features in Azhal Keel Vayu
1	Pranan	Maintain the cardiac function, respiration	Normal
2	Abanan	Act with downward movement	Affected (Constipation)
3	Viyanan	Helps in various movements of body, responsible for sensation	Restricted movement of the joint

4	Udhanan	Control speech	Normal
5	Samanan	Regulates all other vayus	Affected
6	Nagan	Responsible for intelligence helps in opening and closing of eyes	Normal
7	Koorman	Responsible for lacrimation. Helps in visualization of all things of world.	In aged patients acuity of vision is diminished.
8	Kirukaran	Produce cough and sneeze, helps in digestion	Normal
9	Thevathathan	Responsible for lazziness. Rotation of eyeballs.	Affected (Sleeplessness)
10	Thanajeyan	It leaves from the body by blowing up the cranium only on the 3rd day after death.	-

Pitham

S.No.	Pitham	Physiological function	Features in Azhal Keel Vayu
1.	Anar pitham	Digests all the ingested particles.	Affected (Indigestion)
2.	Ranjaga pitham	Increases the blood and gives colour to the blood	Affected
3.	Saathaga pitham	Makes the work to complete what mind thinks to do	Affected (Restricted movements)
4.	Prasaga pitham	Gives colours to skin	Normal
5.	Aalosaga pitham	Responsible for vision of eyes	Affected in old age peoples.

Kabam

It is classified into 5 types

S.No.	Kabam	Physiological function	Features in Azhal Keel Vayu
1.	Avalambagam	Controls other 4 types of kabam	Affected
2.	Kilethagam	Moistens the food	Affected
3.	Pothagam	Helps to know the taste	Normal
4.	Tharpagam	Gives cooling effect to the eyes	Normal
5.	Santhigam	Gives lubrication to joints	Affected (Restricted movements)

In “azhal Keel vayu” the vatha kuttram is mainly affected followed by pitham and kabam.

When the vatha dosham is in vitiated condition, activity and dietary habits provoke the pitha dosham and derange the kabam.

The normal structural quality of the pitham is

- Heat
- Sharpness
- Lubrication
- Relaxation
- Motion

In azhal Keel vayu the deranged pitham may produce stiffness, restriction of movements in the affected joints.

The normal structural quality of kabam is

- Lubrication
- Softness

In azhal Keel vayu the deranged kabam may produce decreased secretion of synovial fluid may lead to loss of lubrication resulting in crepitation of joints.

Udal Thathukkal

There are seven udal thathukkal in human body

S.No.		**Physiological function**	**Features in**
1.	Saaram	Strengthens the body and mind	Affected
2.	Senneer	Preserves brightness, boldness, power and knowledge	Affected
3.	Oon	Gives structure and shape to the body. Responsible for movement	Early stage - Not affected Later stage - Affected
4.	Kozhuppu	Lubricate the joints	Affected
5.	Enbu	Responsible to joint movements	Affected
6.	Moolai	It is present in the bones and gives strength	Affected
7.	Sukkilam (or) suronitham	Mean for reproduction	Normal

PINIARI MURAI

Diagnostic Procedure

Piniyarimuraimai is the method finding out the diseases, which is disturbing the body. This is based upon three main principles and Envagai thervugal.

Envagai Thervu

"நாடி ஸ்பரிசம் நாநிறம் மொழி விழி மலம்
மூத்திரம் இவை மருத்துவராயுதம்"

- *நோய் நாடல் நோய் முதல் நாடல்*

1. Naadi
2. Naa
3. Niram
4. Mozhi
5. Vizhi
6. Sparisam
7. Malam
8. Moothiram

1. Naadi

Naadi is the vitiating element of the body which are vatham, pitham and kabam Naadi is otherwise called uyir thathukkal.

It is felt one inch below the wrist on the radial side by palpating with top of the index, finger, middle finger and ring finger which denotes vatham, pitham and kabam.

Suitable places for pulse reading

"தாது முறைகேள் தனிகுதிச் சந்தொடு
ஓதுறு காமிய முந்தி நெடு மார்பு
காது நெடுமூக்குக் கண்டம் கரம் புருவம்
போதுரு உச்சி புகழ் பத்தும் பார்த்திடே"

Edaikalai	+	Abanan	-	Vatham
Pinkalai	+	Pranan	-	Pitham
Suzhumunai	+	Samanan	-	Kabam

"வாதத்தில் சேத்தும மாகில் வலியோடு வீக்க முண்டாம்

- அகத்தியர் நாடி

"காணப்பா வாத மீறில் கால்கைகள் பொருத்தி நோகும்"

- காவியநாடி

2. Naa (Tongue)

Colour of the tongue and the dhosam responsible for its individually and collectively, clearness of the tongue, black, red, yellow, pallor condition of the tongue, coated tongue, excessive salivation, dryness of the tongue, ulceration, fissures, cancer like growth.

Vadha disease	-	Dark in colour
Pitha disease	-	Yellow in colour
Kaba disease	-	White in colour

In azhal Keel vayu dark dried tongue may be present.

3. Niram (Colour)

Colour of the skin based on three dhosas derangement flushing of pallor of the face, black discolouration of eye and teeth.

In Azhal Keel vayu the affected area is red in colour.

4. Mozhi (Speech)

Disorder of speech, increased tone in speech, low in voice, hoarseness of voice, rales and ronchi with dyspnoea.

In azhal Keel vayu decreased tone of speech because of the severity of disease.

5. Vizhi (Eyes)

Normally vizhi affected in old age. It colour based on derangement of dhosas collectively and individually redness, ulceration, pallor, sunken state of the eye, bulging of the eye balls, bluish discolouration, swelling excessive, lacrimination, condition of sight of vision, heaviness of eyelids.

6. Sparisam (Sense of touch)

The abnormal increased sparisam is clinically called as inflammatory changes.

Increased sparisam – mithaveppam (warmth) felt on affected joint in azhal Keel vayu.

7. Malam (Stod)

Constipation is common in vadha disease. In azhal Keel vayu malam may be affected.

8. Moothiram (urine)

The waste materials are excreted through urine from the body.

Neerkuri

Urine is examined for its colour, froth, specific gravity, quantity frequency, odour.

“வந்த நீர்க்கரி எடை மணம் நுரை எஞ்சலென்
றைந்தியலுளவவை யறைகுது முறையே”

In vatha disease

“ஓங்கிய வாதத்தோர்க்கு நீர்விழுங் குணமுறைக்கிற்
பூங்கொடி கடுத்துநொந்து சிறுத்துடன் பொருமி விழும்”

Neikuri

Siddhars have explained a wonderful method to diagnose a disease by examine the urine with gingely oil.

“அருந்தி மாறிதமும் அவிரோதமாய்
அ.ˑ.கல் அலர்தல் அகாலவூண் தவிர்ந்தழலற
குற்றளவருந்தி உறங்கி வைகறை
ஆடிக்கலசத் தாவியே காது பெய்
தொரு முகூர்த்தக் கலைக்குட்படு நீரின்
நீர்க்குறி நெய்க்குறி நிருமித்தல் கடனே

The patient is subjected to normal for a day and the next day morning his/her urine is examined.

The very first urine of the patient is collected in a glass container. The colour of the urine is noted and drop of gingely oil is added into the container without any oscillation and the spreading nature is examined.

“அருப்பமுற்றார்க் கவ்விதி விலக்கே”

Though the urine should be examined only in the morning, during emergency it may be done in any time.

“அரவென நீண்டின.ˑ.தே வாதம்
அணுகு நெய் பாம்பிற்காணில் அனிலநோய்
ஆழிபோற் பரவிற் அ.ˑ.தே பித்தம்
வட்டமாயின் தணிவிலாப் பித்த நோயாம்
முத்தொத்து நிற்கின் மொழிவதென் கபமே
முத்தெனின் ஐய நோய்தானே”

- If the oil spreads like a snake it indicates the vatham.
- If it spreads like a ring it indicates the pitham.
- It the oil does not spread and gives an appearance of a pearl it is the indication of kabam.
- By the careful examination of the urine with gingely oil the physician may know whether the disease is unable or non curable. For this purposes siddhars have explained various spreading nature of the urine to classify the disease.

Ivagai Nilam

The living places are divided on the basis of the natural geographical features into five distinct types known as “Thinai”.

They are

1. Kurinji - Mountain and its surroundings
2. Mullai - Forest and its surroundings
3. Marutham - Field and its surroundings
4. Neithal - Sea and its surroundings
5. Paalai - Desert and its surroundings

Kurinchi nilam

Inhabitants of this thinai frequently suffer from shivering, fever leading to dysfunction of blood, enlargement of liver and spleen, increase of kabam.

Mullai nilam

Inhabitants of this thinai suffer from pitha disorders and also from disorders due to vatham, increased and liver enlargement.

Neithal Nilam

Inhabitants of this thinai suffer from vatha disorders and also suffer excessive flatulence, enlargement liver and obesity.

Marutha nilam

Inhabitants of this thinai are free from all disorders because all the three dhosas are always kept in proper proportion. This is ideal for leading a healthy life.

Palai Nilam

Inhabitants of this thinai suffer from disorders due to vatha, pitha, kaba diseases.

Udal Vanmai

1. Iyarkai vanmai
2. Kala vanmai
3. Cheyarkai vanmai

1. Iyarkai vanmai

Natural immunity of the body caused by mukkutram by birth.

2. Kala vanmai

Growing of the body and strength according to the age.

3. Cheyarkai vanmai

Improving the health by giving valuable food and medicines.

Relation between paruvakalam (season) Mukkutram and suvai

S.No.	Paruvakalangal	Kuttram	Suvai
1.	Kaarkalam (Avani and Purattasi)	Vatham ↑ ↑ Pitham ↑	Inippu Pulippu Uppu
2.	Koothirkalam (Iyppasi and Karthigai)	Vatham (-) Pitham ↑ ↑	Inippu Karippu Thuvarppu
3.	Munpanikalam (Maarkazhi and Thai)	Pitham (-)	Inippu Pulippu Uppu
4.	Pinpanikalam (Maasi and Panguni)	Kabam ↑	Inippu Pulippu Thuvarppu
5.	Elavenir kalam (Chithirai and Vaikasi)	Kabam ↑↑	Karippu Kaippu Thuvarppu
6.	Muduvenilkalam (Aani and Aadi)	Vatham ↑ Kabam (-)	Inippu

நோய் கணிப்பு விவாதம் (Differential Diagnosis)

1. Vali Keel vayu

“வலிக்குத்தல் வீக்கங் காணும் வாய்தொண்டை, வறட்சி, காய்ச்சல்
தலைவலி மார்து டிப்புத் தாங்கொணா வலிவீக் கந்தான்
நிலவுகாற் கனுக்கு றங்கு நீடுதோள் முழங்கைக் காற்காம்
மலக்குடற் கட்டு வேர்வை வாதத்தில் வாய்வி தாமே

- சபாபதி கையேடு

It is characterized by execruciating pain and swelling knee joints, hip joints, ankle joints, shoulder joints, elbow joints and associated with dryness of mouth, pyreixa, headache, palpitation, constipation and sweating.

2. Iya Keel vayu

“‘கருதருங் கபக்கீல்வாயு கண்டின் உடலிளைக்கும்
உருமெலி வாக்குங் கொள்ளும் உண்டியைச் சுருக்கும் இன்பந்

தருதுயில் நீங்கு முட்டிற் றாங் கொணா வலுவை யாக்கும்
இருமலே விக்கல் வாந்தி சோபைபாண் டெழுப்பும் பாரே”

- சபாபதி கையேடு

It is characterized by loss of weight, anorexia, severe pain in the knee joints, insomnia, cough, hiccough, vomiting, anaemia and dropsy. The common site are vertebrae, hip joint, knee joint.

3. Vali Iya Keel vayu

“வயங்வா தக்க பக்கில் வாயுவான் வலிமி ருந்ததே
உயங்குநீர் கோத்துக் கீல்கள் ஓரியின் தலைபோற் காணும்
நயங்கொள்ள முடக்கல் நீட்டல் தண்ணிடா மெய்யுங் காயும்
மயங்குறு முறக்க மின்னாய் மன்னிய நெரிக்கட் டாமே”.

It is characterized by pain in the joints and effusion of joint fluid, swelling, restricted joint movement, pyrexia, fainting, insomnia, lymph adenopathy. The affected joints look like “fox’s head”.

Aim of treatment of Azhal Keel vayu

In siddha system, treatment is not only for removal of diseases but for the prevention and improving the body condition after removal of disease.

- Prevention
- Relieve pain
- Restore function
- Reduce disability if any

Prevention

To prevent azhal Keel vayu is

- Control the body weight by diet and exercise
- Avoid the intake of excess sour, astringent, and bitter tasted foods.
- Modify the nature of work gives stress to a particular joint (e.g) avoid prolonged standing and long distance walking.
- To follow the “Noi Anuga Vithi”
- The recurrence is prevented by yoga and Pranayama.

Treatment

Normalizing the vitiated thiridosha there by retaining body’s natural health.

In azhal Keel vayu, the deranged vatham is brought to its normal state by purgation (விரேசனம்)

“விரேசனத்தால் வாதந்தாழும்

1. 15 ml of vellai ennai is given with warm water early morning (single dose) in empty stomach before starting the treatment with trial drug.
2. Internal Medicine- KANDATHIRI LEGHIYAM 6gms (bd)
3. External medicine- NAKKA PUSA MUKKUTTENNAI(60ml)

Apart from other departments sirappu maruthuvam department gives equal important to external therapy in siddha system of medicine along with its internal and external medicine.

External therapies : Varmam, Yoga asanam.

Varmam

Life energy flows in the body in a particular pathway. There are certain key points in the body where the life energy "Vaasi" is concentrated. Normally these are the points where two bones joint or a muscle inserts into a bone or the blood vessels, nerves are prominent. These points called "Varmam points".

VARMAM THERAPY

The therapy of physical manipulation either by applying pressure on the varmam points or using massage therapy with specific medicated oil or blowing certain medicines in the nose or ear is called as varmam treatment.

Varmam are rhythmically tuned by varmam therapies for managing various disease like nervous disorders, arthrits, back pain, spinal problems etc.

Varma points to be manipulated for osteoarthritis are as follow.

- **Kaal Mootu varmam**
  - Centre part of posterior aspect of both knee joints. Mild pressure is applied using tips of middle three fingers.
- **Mootu suzharchi Varmam**
  - This method stimulates varmam points around knee joint by a circulatory gripping massage around patella using thumb and index finger.
- **Santhu varmam**
  - Location : On either side of the mootu varmam.
- **Sirattai varmam**
  - Location : On the patella bone.
- **Mozhi poruthu varmam**
  - Location : Posterior surface of the knee joint

Yoga asanam

Yoga therapy is one of the form of relaxing body and mind. Certain simple asana techniques are discussed to knee pain and strengthening thigh muscle.

Asanam

- Vajrasanam
- Padmasanam
- Utkatasanam
- Gomukhasanam

Vajrasanam

It is also known as the diamond pose or “thunderbolt”

It is a kneeling position sitting on the heels.

The practitioner sits on the heels with the calves beneath the thighs. There is a four finger gap between the knee caps, and the first toe of both the feet touch each other and sit erect.

Benefits

This asana may help in digestive issues like constipation.

It strengthens the muscles of the legs and back.

Padmasanam

It is also known as the LOTUS pose.

It is a cross legged sitting asana

Benefits

Eases menstrual discomfort.

Helps joints and ligaments flexible.

Utkatasana

Chair pose, fiexe pose, lighting bolt pose.

Benefits

This asana increases strength, balance and stability.

The hamstrings, quadriceps, gluteal muscles and the erector spinae muscles of the back are exercised and strengthened.

Gomukhasana

It is otherwise known as low face pose

The asana stretches several parts of the body simultaneously , including ankles, thighs, hips, chest, neck, arms and hands.

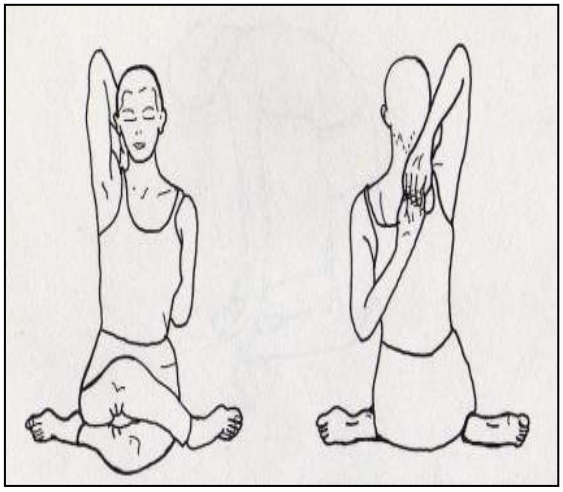
Benefits

It helps induce relaxation

Helpful in relieving ailments like diabetes, high blood pressure and sexual malfuntion.

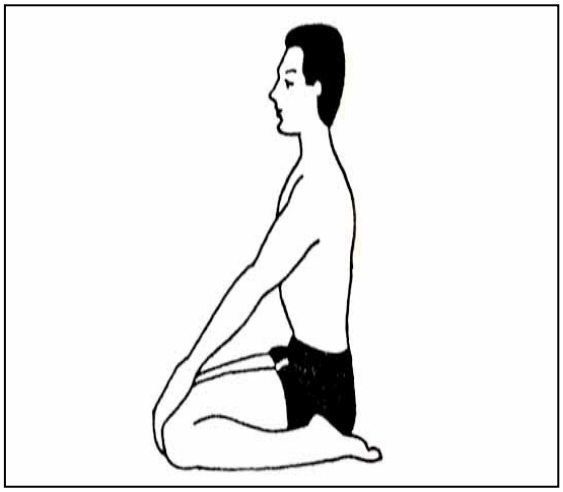
ASANAMS

UKKATASANA



GOMUKASANAM

PADMASANAM



VAJRASANAM

MODERN ASPECT

ANATOMY OF KNEE:

Knee anatomy is about the structure of the knee – that is, the parts that makeup the knee. This article also tells you how a normal knee works and provides resources for problems of the knee joint or its parts including knee injuries.

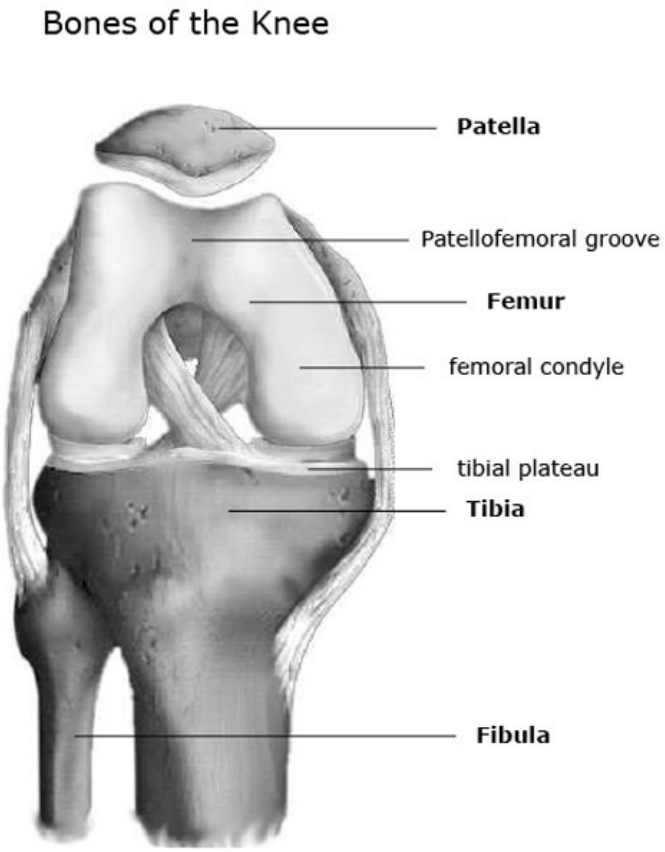
Our knee is the most complicated and largest joint in our body. It's also the most vulnerable because it bears enormous weight and pressure loads while providing flexible movement. When we walk, our knees support 1.5 times our body weight; climbing stairs is about 3-4 times our body weight and squatting about 8 times.

The knee joint is a synovial joint which connects the femur, our thigh bone and longest bone in the body, to the tibia, our shinbone and second longest bone. There are two joints in the knee the tibiofemoral joint, which joins the tibia to the femur and the patellofemoral joint which joins the kneecap to the femur. These two joints work together to form a modified hinge joint that allows the knee to bend and straighten, but also to rotate slightly and from side to side.

The knee is part of a chain that includes the pelvis, hip, and upper leg above, and the lower leg, ankle and foot below. All of these work together and depend on each other for function and movement.

The knee joint bears most of the weight of the body. When we're sitting, the tibia and femur barely touch; standing they lock together to form a stable unit. Let's look at a normal knee joint to understand how the parts (anatomy) work together (function) and how knee problems can occur.

STRUCTURES OF THE KNEE:



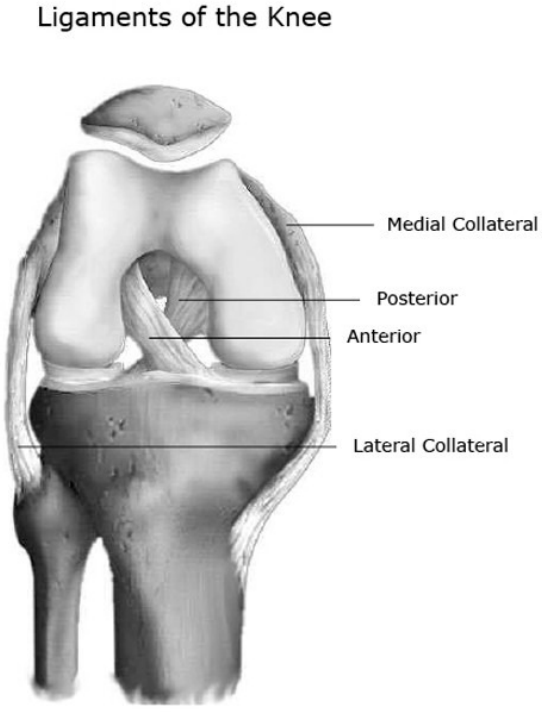
The main parts of the knee joint are bones, ligaments, tendons, cartilages and a joint capsule, all of which are made of collagen. Collagen is a fibrous tissue present throughout our body. As we age, collagen breaks down.

The adult skeleton is mainly made of bone and a little cartilage in places. Bone and cartilage are both connective tissues, with specialized cells called chondrocytes embedded in a gel-like matrix of collagen and elastin fibers. Cartilage can be hyaline, fibrocartilage and elastic and differ based on the proportions of collagen and elastin. Cartilage is a stiff but flexible tissue that is good with weight bearing which is why it is found in our joints. Cartilage has almost no blood vessels and is very bad at repairing itself. Bone is full of blood vessels and is very good at self repair. It is the high water content that makes cartilage flexible.

Bones of the Knee

The bones give strength, stability and flexibility in the knee. Four bones make up the knee :

- Tibia —commonly called the shin bone, runs from the knee to the ankle. The top of the tibia is made of two plateaus and a knuckle-like protuberance called the tibial tubercle. Attached to the top of the tibia on each side of the tibial plateau are two crescent-shaped shock-absorbing cartilages called menisci which help stabilize the knee.
- Patella—the kneecap is a flat, triangular bone; the patella moves when the leg moves. It's function is to relieve friction between the bones and muscles when the knee is bent or straightened and to protect the knee joint. The kneecap glides along the bottom front surface of the femur between two protuberances called femoral condyles. These condyles form a groove called the patellofemoral groove.
- Femur—commonly called the thigh bone; it's the largest, longest and strongest bone in the body. The round knobs at the end of the bone are called condyles.
- Fibula—long, thin bone in the lower leg on the lateral side, and runs along side the tibia from the knee to the ankle.



The knee works similarly to a rounded surface sitting atop a flat surface. The function of ligaments is to attach bones to bones and give strength and stability to the knee as the knee has very little stability. Ligaments are strong, tough bands that are not particularly flexible. Once stretched, they tend to stay stretched and if stretched too far, they snap.

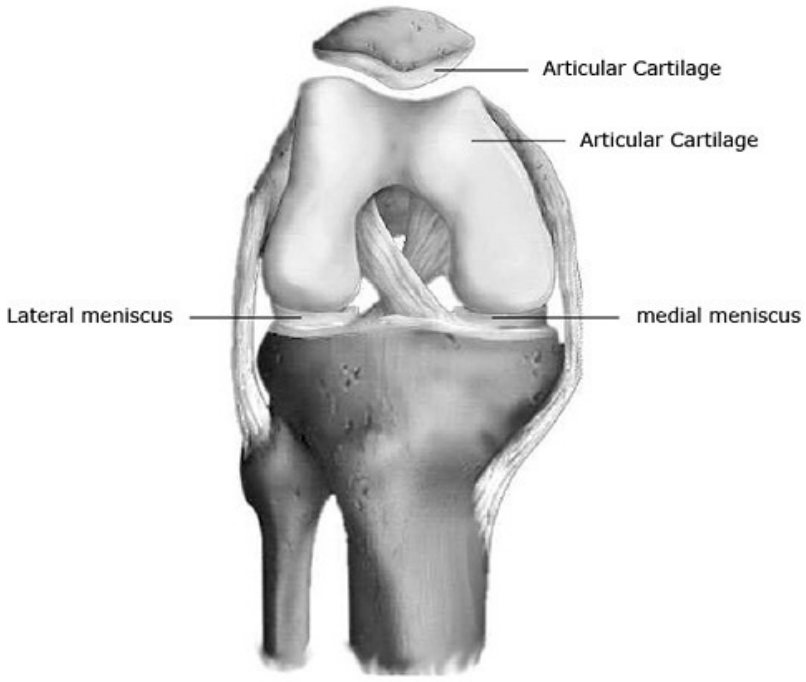
- Medial Collateral Ligament (tibial collateral ligament) – attaches the medial side of the femur to the medial side of the tibia and limits sideways motion of your knee.
- Lateral Collateral Ligament (fibular collateral ligament) – attaches the lateral side of the femur to the lateral side of the fibula and limits sideways motion of your knee.
- Anterior cruciate ligament – attaches the tibia and the femur in the center of your knee; it's located deep inside the knee and in front of the posterior cruciate ligament. It limits rotation and forward motion of the tibia.
- Posterior cruciate ligament – is the strongest ligament and attaches the tibia and the femur; it's also deep inside the knee behind the anterior cruciate ligament. It limits the backwards motion of the knee.
- Patellar ligament – attaches the kneecap to the tibia

The pair of collateral ligaments keep the knee from moving too far side-to-side. The cruciate ligaments crisscross each other in the center of the knee. They allow the tibia to "swing" back and forth under the femur without the tibia sliding too far forward or backward under the femur. Working together, the 4 ligaments are the most important in structures in controlling stability of the knee. There is also a patellar ligament that attaches the kneecap to the tibia and aids in stability. A belt of fascia called the iliotibial band runs along the outside of the leg from the hip down to the knee and helps limit the lateral movement of the knee.

Tendons in the Knee

Tendons are elastic tissues that technically part of the muscle and connect muscles to bones. Many of the tendons serve to stabilize the knee. There are two major tendons in the knee—the quadriceps and patellar. The quadriceps tendon connects the quadriceps muscles of the thigh to the kneecap and provides the power for straightening the knee. It also helps hold the patella in the patellofemoral groove in the femur. The patellar tendon connects the kneecap to the shinbone (tibia)—which means it's really a ligament.

Cartilage of the Knee

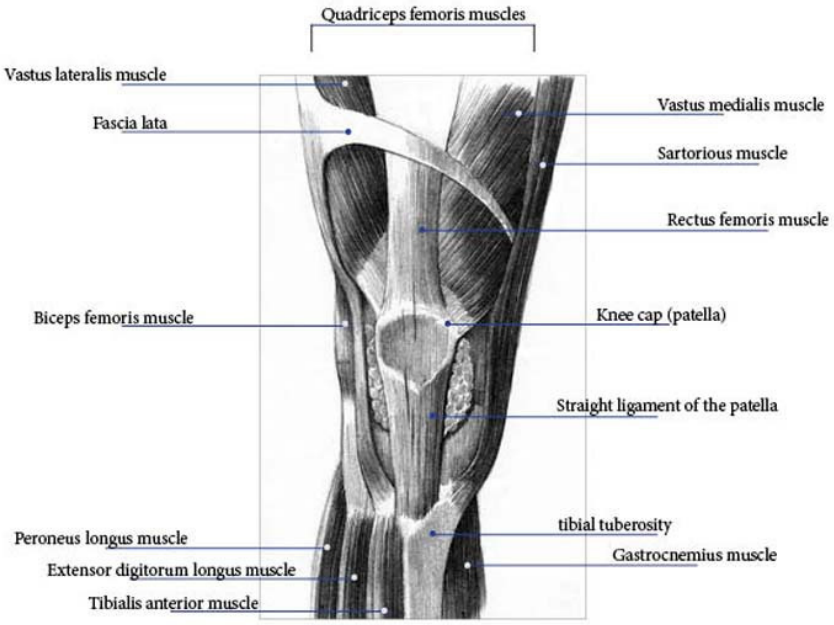


The ends of bones that touch other bones—a joint—are covered with articular cartilage. It's gets its name "articular" because when bones move against each other they are said to "articulate." Articular cartilage is a white, smooth, fibrous connective tissue that covers the ends of bones and protects the bones as the joint moves. It also allows the bones to move more freely against each other. The articular cartilages of the knee cover the ends of the femur, the top of the tibia and the back of the patella. In the middle of the knee are menisci—disc shaped cushions that act as shock absorbers.

- Medial meniscus
  - The medial meniscus is made of fibrous, crescent shaped cartilage and attached to the tibia, on the inside of the knee
- Lateral meniscus
  - This is made of fibrous, crescent shaped cartilage and attached to the tibia, on the outside of the knee
- Articular cartilage
  - Found on the ends of all bones in any joint—in the knee joint it covers the ends of the femur and tibia and the back of the patella. The articular cartilage is kept slippery by synovial fluid (which looks like egg white) made by the

synovial membrane (joint lining). Since the cartilage is smooth and slippery, the bones move against each other easily and without pain.

- In a healthy knee, the rubbery meniscus cartilage absorbs shock and the side forces placed on the knee. Together, the menisci sit on top of the tibia and help spread the weight bearing force over a larger area. Because the menisci are shaped like a shallow socket to accommodate the end of the femur, they help the ligaments in making the knee stable. Because the menisci help spread out the weight bearing across the joint, they keep the articular cartilage from wearing away at friction points.
- The weight bearing bones in our body are usually protected with articular cartilage, which is a thin, tough, flexible, slippery surface which is lubricated by synovial fluid. The synovial fluid is both viscous and sticky lubricant. Synovial fluid and articular cartilage are a very slippery combination—3 times more slippery than skating on ice, 4 to 10 times more slippery than a metal on plastic knee replacement. Synovial fluid is what allows us to flex our joints under great pressure without wear.



The muscles in the leg keep the knee stable, well aligned and moving—the quadriceps (thigh) and hamstrings. There are two main muscle groups—the quadriceps and hamstrings. The quadriceps are a collection of 4 muscles on the front of the thigh and are responsible for straightening the knee by bringing a bent knee to a straight position. The hamstrings is a group of 3 muscles on the back of the thigh and control the knee moving from a straight position to a bent position.

The Joint Capsule

The capsule is a thick, fibrous structure that wraps around the knee joint. Inside the capsule is the synovial membrane which is lined by the synovium, a soft tissue that secretes synovial fluid when it gets inflamed and provides lubrication for the knee.

Bursae

There are up to 13 bursae of various sizes in and around the knee. These fluid filled sacs cushion the joint and reduce friction between muscles, bones, tendons and ligaments. There are bursa located underneath the tendons and ligaments on both the lateral and medial sides of the knee. The prepatellar bursa is one of the most significant bursa and is located on the front of the knee just under the skin. It protects the kneecap. In addition to bursae, there is a infra patellar fat pad that helps cushion the kneecap.

Plicae

Plicae are folds in the synovium. Plicae rarely cause problems but sometimes they can get caught between the femur and kneecap and cause pain.

KNEE FUNCTION:

So now we have all the parts, let's see how the knee moves (articulates) which is how we walk, stoop, jump, etc. The knee has limited movement and is designed to move like a hinge.

The Quadriceps Mechanism is made up of the patella (kneecap), patellar tendon, and the quadriceps muscles (thigh) on the front of the upper leg. The patella fits into the patellofemoral groove on the front of the femur and acts like a fulcrum to give the leg its power. The patella slides up an down the groove as the knee bends. When the quadriceps muscles contract they cause the knee to straighten. When they relax, the knee bends.

In addition the hamstring and calf muscles help flex and support the knee.

While age is a major risk factor for osteoarthritis of the knee, young people can get it, too. For some individuals, it may be hereditary. For others, osteoarthritis of the knee can result from injury or infection or even from being overweight. Here are answers to your questions about knee osteoarthritis, including how it's treated and what you can do at home to ease the pain.

Osteoarthritis, commonly known as wear-and-tear arthritis, is a condition in which the natural cushioning between joints cartilage wears away. When this happens, the bones of the joints rub more closely against one another with less of the shock-absorbing benefits of cartilage. The rubbing results in pain, swelling, stiffness, decreased ability to move and, sometimes, the formation of bone spurs.

Osteoarthritis is the most common type of arthritis. While it can occur even in young people, the chance of developing osteoarthritis rises after age 45. According to the Arthritis Foundation, more than 27 million people in the U.S. have osteoarthritis, with the knee being one of the most commonly affected areas. Women are more likely to have osteoarthritis than men.

The most common cause of osteoarthritis of the knee is age. Almost everyone will eventually develop some degree of osteoarthritis. However, several factors increase the risk of developing significant arthritis at an earlier age.

CAUSES:

- **Age**. The ability of cartilage to heal decreases as a person gets older.
- Weight. Weight increases pressure on all the joints, especially the knees. Every pound of weight you gain adds 3 to 4 pounds of extra weight on your knees.
- **Heredity**. This includes genetic mutations that might make a person more likely to develop osteoarthritis of the knee. It may also be due to inherited abnormalities in the shape of the bones that surround the knee joint.
- **Gender**. Women ages 55 and older are more likely than men to develop osteoarthritis of the knee.
- **Repetitive stress injuries**. These are usually a result of the type of job a person has. People with certain occupations that include a lot of activity that can stress the joint, such as kneeling, squatting, or lifting heavy weights (55 pounds or more), are more likely to develop osteoarthritis of the knee because of the constant pressure on the joint.
- **Athletics**. Athletes involved in soccer, tennis, or long-distance running may be at higher risk for developing osteoarthritis of the knee. That means athletes should take precautions to avoid injury. However, it's important to note that regular moderate exercise strengthens joints and can decrease the risk of osteoarthritis. In fact, weak muscles around the knee can lead to osteoarthritis.
- **Other illnesse**s. People with rheumatoid arthritis, the second most common type of arthritis, are also more likely to develop osteoarthritis. People with certain metabolic disorders, such as iron overload or excess growth hormone, also run a higher risk of osteoarthritis.

SYMPTOMS OF OSTEOARTHRITIS OF THE KNEE MAY INCLUDE:

- Pain that increases when you are active, but gets a little better with rest
- Swelling
- Feeling of warmth in the joint
- Stiffness in the knee, especially in the morning or when you have been sitting for a while
- Decrease in mobility of the knee, making it difficult to get in and out of chairs or cars, use the stairs, or walk
- Creaking, crackly sound that is heard when the knee moves

PATHOPHYSIOLOGY:

The knee joint consists of both approximation of the proximal tibia and the distal end of the femur. The cartilage located on the ends of the femur and tibia contain an extra cellular matrix that contains type 2 protoglycans that function by drawing fluid into the joint causing increased shock absorption and proper joint nutrition.There is some evidence to support that as the aging process occurs the type 2 collagen fibers decrease in size and therefore less fluid an nutrition gets into the joint surfaces eventually leading to decreased protection along boney surfaces.

The knee (art. genus) is a synovial joint, which consists of 3 articulations. The primary joint, art. tibiofemoral, is located between the convex femoral condyles and the concave tibial condyles.There is also the art. patellofemoralis between the femur and the patella and the art. tibiofibularis located between the tibia and fibula. OA can only occur in the two primary articulations of the knee, namely the tibiofemoral and patellofemoral joint, because they have to sustain more motion than the art. tibiofibularis.

"The pathogenesis of knee OA have been linked to biomechanical and biochemical changes in the cartilage of the knee joint." The cartilage ensures that the bone surfaces can move painless and with low friction to each other. In OA, the cartilage decreases in thickness and quality, it becomes thinner and softer, cracks may occur and it will eventually crumble off. Cartilage that has been damaged, cannot recover. Finally the cartilage will disappear. The bone surfaces can also be affected, the bone will expand and spurs (osteophytes) will develop.

Not only the cartilage can be affected, there is also occur laxity of the ligaments and muscle atrophy.

CHARACTERISTICS / CLINICAL PRESENTATION:

Signs of knee osteoarthritis are pain at beginning of the movement, later on pain during movement and eventually permanent pain. These patients will also experience a loss of function like stiffness, decreased range of motion (ROM) and impairment in everyday activities. Other possible characteristics of knee OA are bony enlargement, crepitus, joint-line tenderness and elevated sensitivity to cold and/or damp.

We can subdivide knee osteoarthritis in 5 stages:

- Stage 0: This is the "normal" knee health, without any pain in the joint functions.
- Stage 1: A person in this stage has very minor bone spur growth and is not experiencing any pain or discomfort.
- Stage 2: This is the stage where people will experience symptoms for the first time. They will have pain after a long day of walking and will sense a greater stiffness in the joint. It is a mild stage of the condition, but X-rays will already reveal greater bone spur growth. The cartilage will likely remain at a healthy size.
- Stage 3: Stage 3 is considered as a moderate osteoarthritis. People with this stage will experience a frequent pain during movement. The joint stiffness will also be more present, especially after sitting for long periods and in the morning. The cartilage between the bones shows obvious damage, and the space between the bones is getting smaller.
- Stage 4: This is the most severe stage of osteoarthritis. The joint space between the bones will be dramatically reduced, the cartilage will almost be completely gone and the synovial fluid will be decreased. That is why people will experience lots of pain and discomfort during walking or moving the joint.

DIFFERENTIAL DIAGNOSIS:

The diagnosis can be established by clinical examination, and it can be confirmed by X-rays. The main characteristics are changes in the subchondral bone, joint space narrowing, subchondral sclerosis, subchondral cyst formation and osteophytes. In early stage of osteoarthritis, the results of the radiography can show a minimal unequal joint space narrowing. If it deteriorates you still find the same problems, but the patient experiences a lateral subluxation of the tibia as well. If it deteriorates more, the joint line will disappear completely. It is shown in the picture that the medial joint space is more narrow than the lateral joint line.

Some differential diagnosis can be: bursitis, iliotibial band syndrome, ligamentous instability (medial and lateral collateral ligaments) and meniscal pathology, these are conditions in whereby the soft tissues of the knee are affected. But also other forms of arthritis can lead to differential diagnosis of the knee, think of gout and pseudogout, rheumatoid arthritis and septic arthritis.

DIAGNOSTIC PROCEDURES:

SYMPTOMS:

PRIMARY:

- Pain
- Stiffness, particularly in the morning
- Sensitivity when kneeling or bending
- Decrease in the abilities of daily functioning
- More commonly diagnosed

SECONDARY:

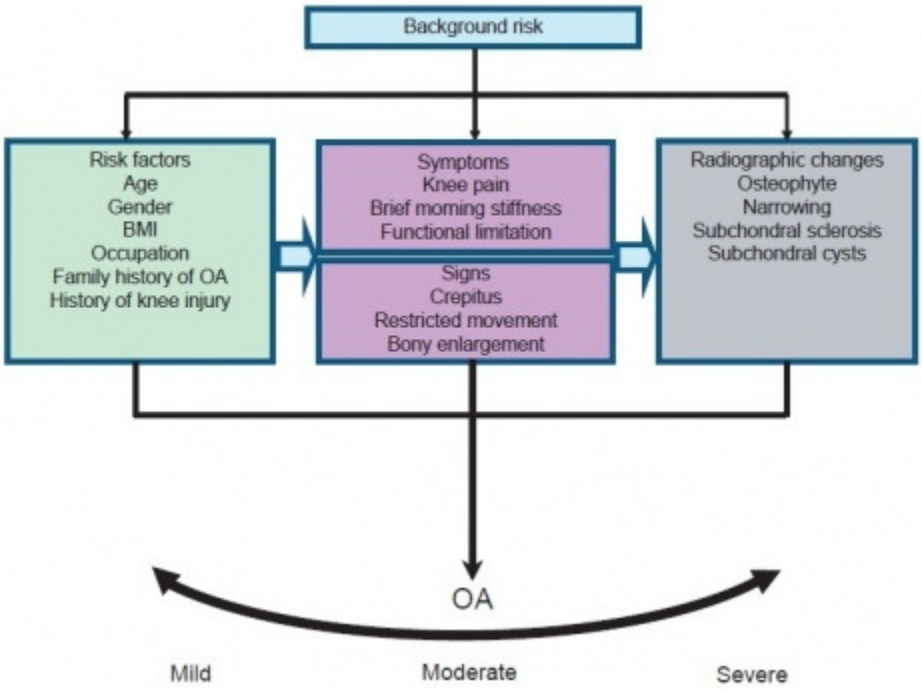
- Loss of mobility in the affected joint
- Decrease in muscle power
- Instability of the joint
- Crepitations
- This type of OA can be caused by obesity, trauma, inflammatory or genetically

X-ray: The basic X-ray is used to research breakdown of cartilage, narrowing of joint space, forming of bone spurs and to exclude other causes of pain in the affected joint.

Arthrocentesis: This is a procedure which can be performed at the doctor's office. A sterile needle is used to take samples of joint fluid which can then be examined for cartilage fragments, infection or gout.

Arthroscopy: is a surgical technique where a camera is inserted in the affected joint to obtain visual information about the damage caused to the joint by the osteoarthritis.

The European League against Rheumatism developed diagnostic criteria for diagnosing knee osteoarthritis. The most important factors are shown in the following figure.



EULAR evidence-based recommendations for the diagnosis of knee osteoarthritis

EXAMINATION:

If a patient is referred to you by a doctor, it is most likely he performed a medical examination. It is imperative to look at his/her findings when examination the patient.

- Inspection: Mind the position of the joints when in rest and how the patient moves. This can be accomplished by making the patient perform simulations of daily activities such as getting up from and down on a chair, stair climbing, etc.
- Palpation: Mind: swelling, temperature differences, muscle tonus. Also be wary of possible bone spurs (osteocytes) that have formed on the edge of the joint. These osteocytes are a serious indication towards osteoarthritis.
- Examination of basic functions: Testing of muscle power, coordination, mobility, balance and also stability of the joint. These factors can be tested by active test like standing on one leg and passive manual tests. When testing stability of the joint muscle strength and proprioception are of significant importance.

MATERIALS AND METHODS

The clinical study on Azhal Keel vayu (osteoarthritis of knee joint) was carried out in the post graduate department of sirappu Maruthuvam, Government Siddha Medical College, at Palayamkottai. In this study 40 patients (who satisfy the inclusion criteria and exclusion criteria) were treated as OP and IP

Selection of the patients

Age : 30 – 60 yrs

Sex : Both Male and Female

Clinical findings

Inclusion criteria

The patients were selected on the basis of the following clinical findings.

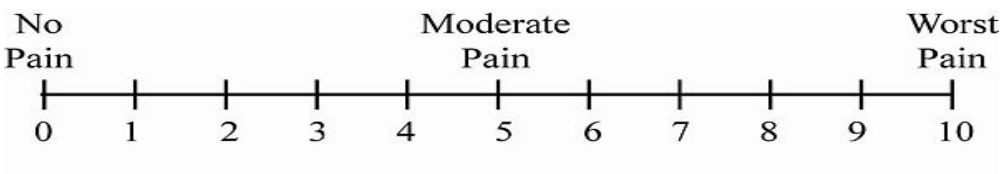
- Patients having symptoms of joint pain in one or both knee joints, swelling, tenderness, stiffness, crepitation, restricted movements of joints.
- Patients who are willing to give blood samples for laboratory investigation.
- Patients who are willing to take radiological imaging before and after treatment.
- Patients who are willing to participate in this study with the knowledge of potential risks.

The detailed history was taken from the patient about

1. Occupation
2. Socio economic status
3. Diet and habits

Pain assessment

Universal pain assessment scale



A. 0 - No pain

B. 1-3 - Mild pain

C. 4-6 - Moderate pain

D. 7-10 - Severe pain

Reference: Clinical Manual for Nursing Practice. (National Institute of Heatlth Warren Grant Magnuson Clinical centre.

GRADATION:

Grade 1: Fit for all activities to do their work without support (Normal)

Grade 2: Mild Pain and Mild restriction of Movements

Grade 3: Moderate Pain and Moderate restriction of Movements

Grade 4: Severe Pain and Severe restriction of Movement

Diagnosis

The diagnosis was made by following siddha diagnostic methods kaalam, poriaridhal, pulanaridhal, udalthathukkal, Naadi and Envagai Thervugal and the diagnosis of Azhal Keel vayu obtained which correlated with modern diagnosis of osteoarthritis of knee joints by the x-ray findings.

Exclusion criteria

- Cardiac disease
- Rheumatoid arthritis
- Use of narcotic drugs
- Pregnancy and lactating women
- History of trauma
- Carcinoma patient
- Other Systemic Illness
- Tuberculosis
- Immuno compromised patient
- Clinically significant abnormal laboratory values.

WITHDRAWAL CRITERIA:

- Intolerance to the drug and development of adverse reactions during drug trial.
- Poor Patient compliance & defaulters
- Patient turned unwilling to continue in the course of clinical trial.
- Occurrence of any serious illness.

INVESTIGATION

The following investigations were done in all selected patients in the laboratory of Government Siddha Medical College, Palayamkottai.

BLOOD

- Total WBC count
- Differential WBC count
- Erythrocyte sedimentation rate
- Haemoglobin estimation
- Estimation of Blood sugar
- Estimation of Blood urea
- Estimation of serum cholesterol

URINE

- Albumin
- Sugar
- Deposit

RADIOLOGICAL INVESTIGATIONS

- X-ray of both knee joint- AP view and lateral view

TREATMENT

Vellai ennai 15ml at early morning, in empty stomach with hot water. All the patients were treated with the following medicine.

- Kandathri leghiyam(Internal)

  6 grms (BD)

- NAKKA PUSA MUKKUTTENNAI

  60ml, as external application

Varmam and yoga asanam are applied as the complimentary therapy

All patients were advised to follow the dietary regimens (or) pathiyam.

The Bio-Chemical analysis was done in the Biochemistry Department and Pharmacological analysis was done in the Pharmacological laboratory of KMCH college of Pharmacy.

RESULTS AND OBSERVATION

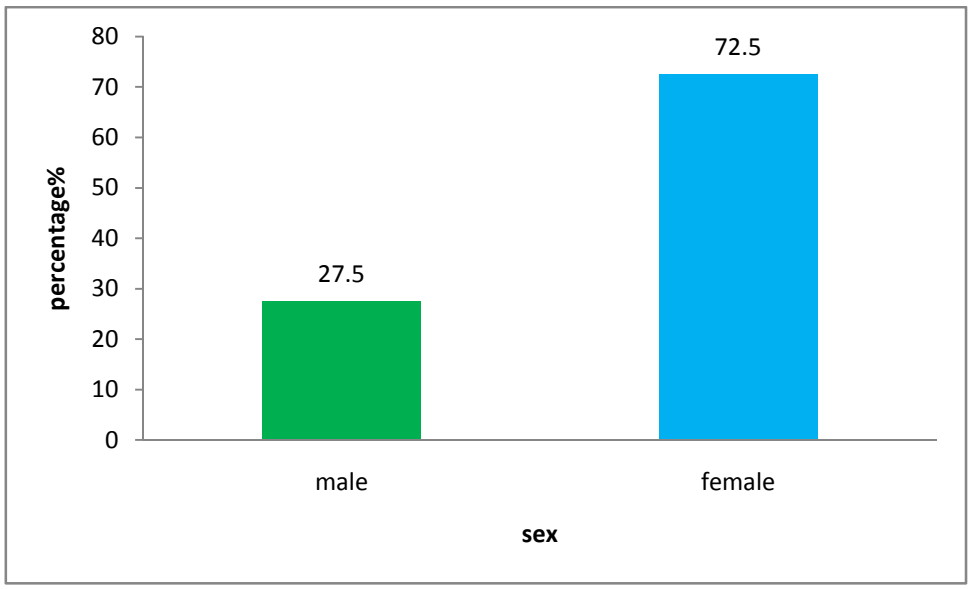
For the clinical study 40 patients were selected and treated in PG-III Sirappu Maruthuvam Department, Government Siddha Medical College and Hospital, Palayamkottai. Results were observed with respect to the following criteria.

1. Gender distribution
2. Age distribution
3. Kaalam
4. Occupation
5. Seasonal variations
6. Thinai
7. Socio-economic status
8. Dietary habits
9. Precipitating factors
10. Mode of onset
11. Duration of conditions
12. Clinical features
13. Conflict in Kanmethiriam
14. Disturbance in Vatham
15. Disturbance in Pitham
16. Disturbance in Kabam
17. Disturbance in Udal kattugal
18. Envagai Thervugal
19. Naadi
20. Neikuri
21. Selection of patients
22. Assessment of results
    - Assessment of curative effect in knee osteoarthritis patients treated with trial drugs alone.
    - Trial drugs along with complementary therapy (Yoga asanam)
    - Trial drugs along with complementary therapy (Varmam)
    - Effect of Trial drug along with complements therapies.
    - Comparison between effective of trial drug and trial drug with complementary therapies
    - Overall Results after treatment.

RESULTS AND OBSERVATION

1. GENDER DISTRIBUTION

S.No	Gender	No of Cases	Percentage (%)
1	Male	11	27.5
2.	Female	29	72.5
	Total	40	100

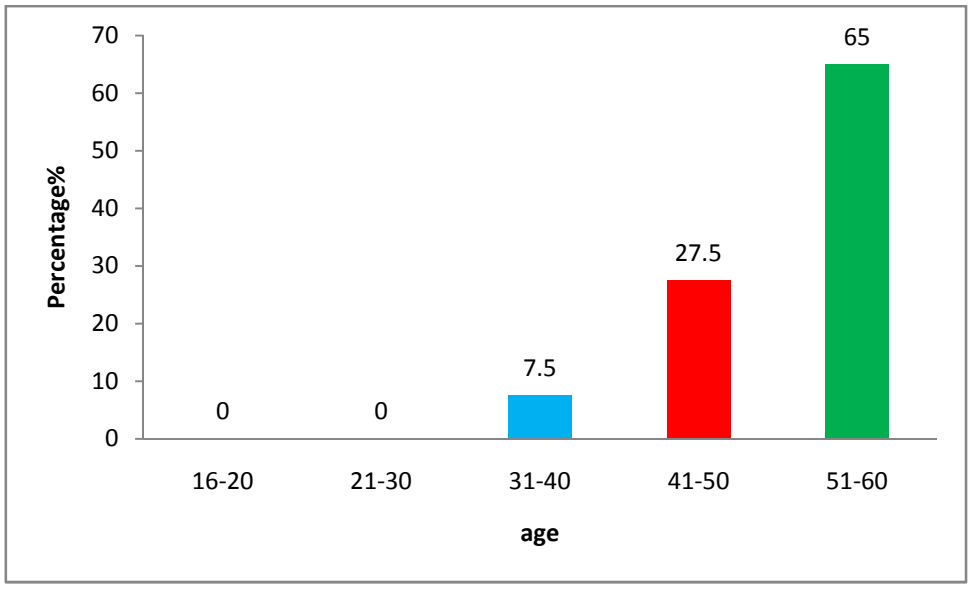


Inference

Among the 40 patients selected for this study 27.5% are male and 72.5% are female.

2. AGE DISTRIBUTION

S.No	Age (years)	No of Cases	Percentage (%)
1	30-40	3	7.5
2.	41-50	11	27.5
3.	51-60	26	65
	Total	40	100

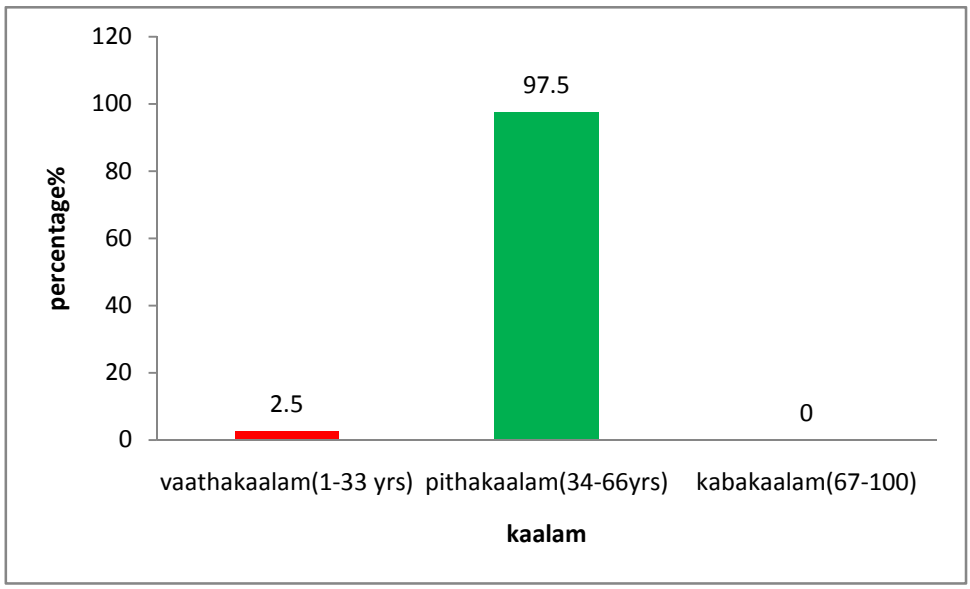


Inference

The prevalence of the diseases is found to be higher in the age group of 51-60 years.

3. KAALAM

S.No	Kaalam	No of Cases	Percentage (%)
1	Vathakaalam (Upto 33 years)	1	2.5
2.	Pithakaalam (33 years to 66 years)	39	97.5
3.	Kabhakaalam (Above 66 years)	0	0
	Total	40	100



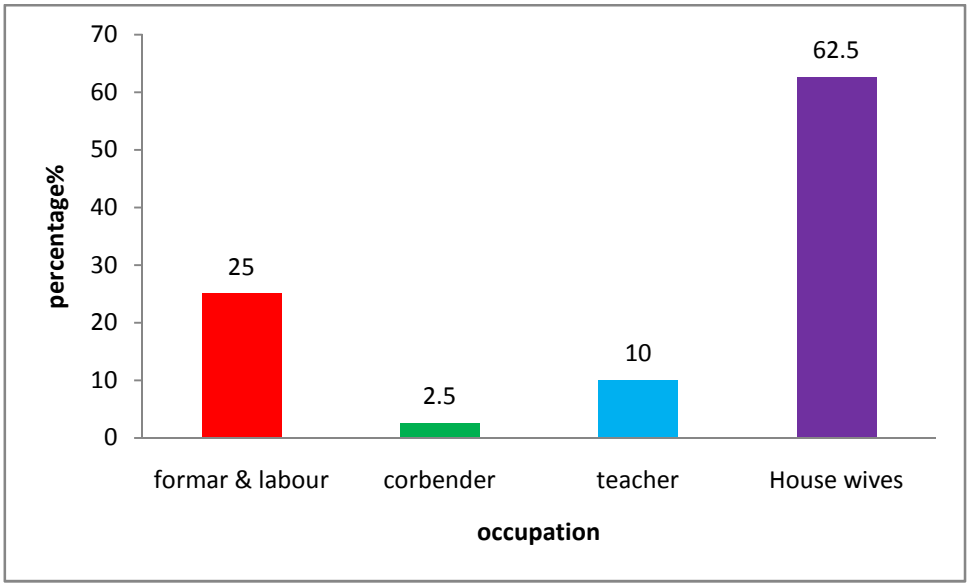
Inference

Out of 40 cases, 97.5% of cases were found to be in pithakaalam.

2.5% of cases were found to be in vadhakaalam.

5.OCCUPATION

S.No	Occupation	No of Cases	Percentage (%)
1	Farmer & Labour	10	25
2.	Carpenter/ Mason	1	2.5
3.	Teacher	4	10
4.	Housewife	25	62.5
5.	House keeper	0	0
	Total	40	100

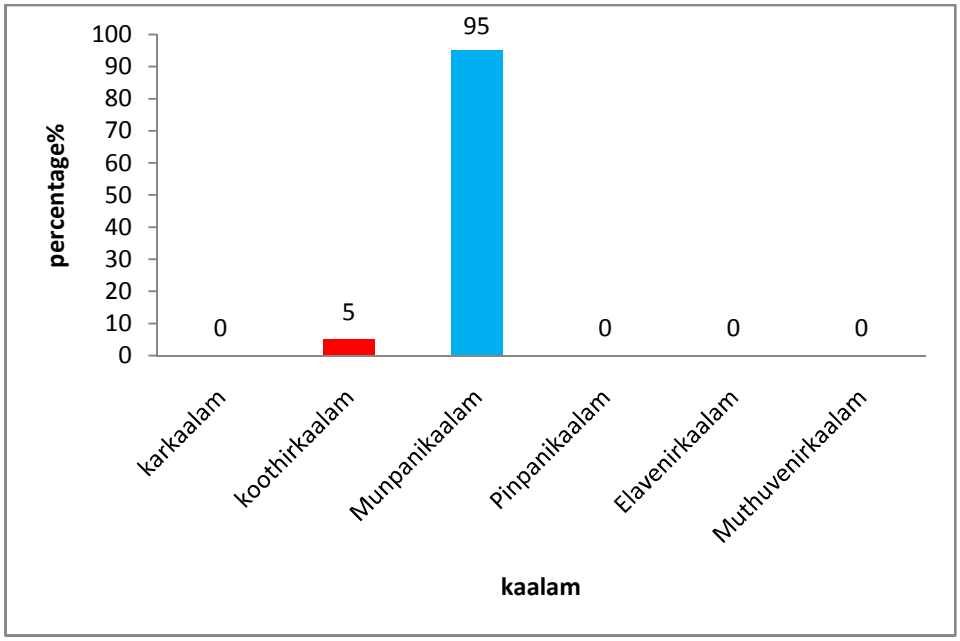


Inference

Out of 40 cases, in this study the rates of incidence is higher in occupational group which includes housewives 62.5% and farmer & labour 25% and teacher 10% and carpenter/mason 2.5%.

6. SEASONAL VARIATIONS

S.No	Seasons	No of Cases	Percentage (%)
1	Kaarkaalam (Aug 16- Oct 15)	0	0
2.	Koothirkaalam (Oct 16- Dec 15)	2	5
3.	Mupanikaalam (Dec 16- Feb 15)	38	95
4.	Pinpani kaalam (Feb 16 – Apr 15)	0	0
5.	Ilavenirkaalam (Apr 16-June15)	0	0
6.	Muthuvenilkaalam (June 16 – Aug	0	0
	Total	40	100

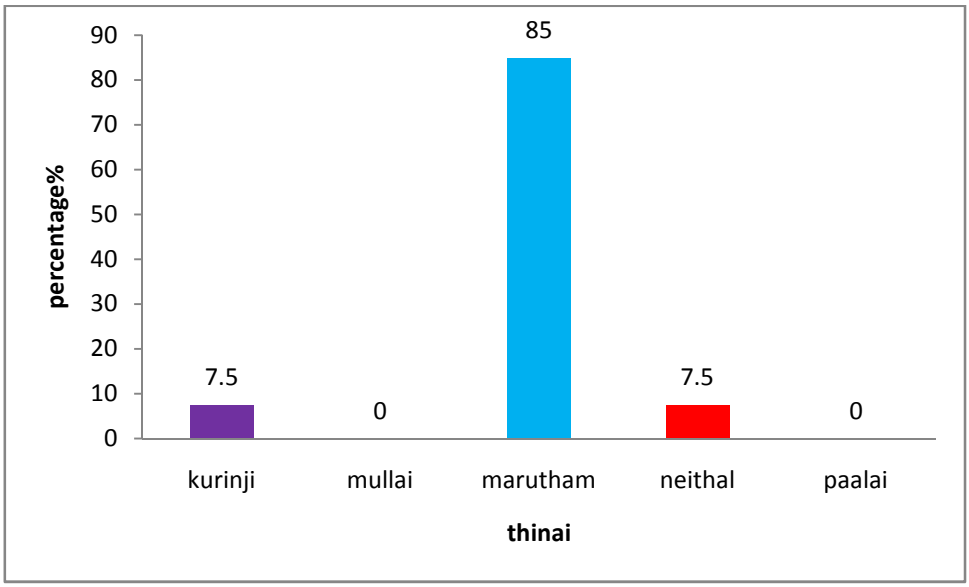


Inference

Out of 40 cases, 2 patients (5%) were admitted in koothirkaalam, 38 patients (95%) were admitted in Munpanikaalam .

7. THINAI

S.No	Seasons	No of Cases	Percentage (%)
1	Kurinji (Hill area)	3	7.5
2.	Mullai (Forest area)	0	0
3.	Marutham (Fertile area)	34	85
4.	Neithal (Coastal area)	3	7.5
5.	Paalai (Desert land)	0	0
	Total	40	100

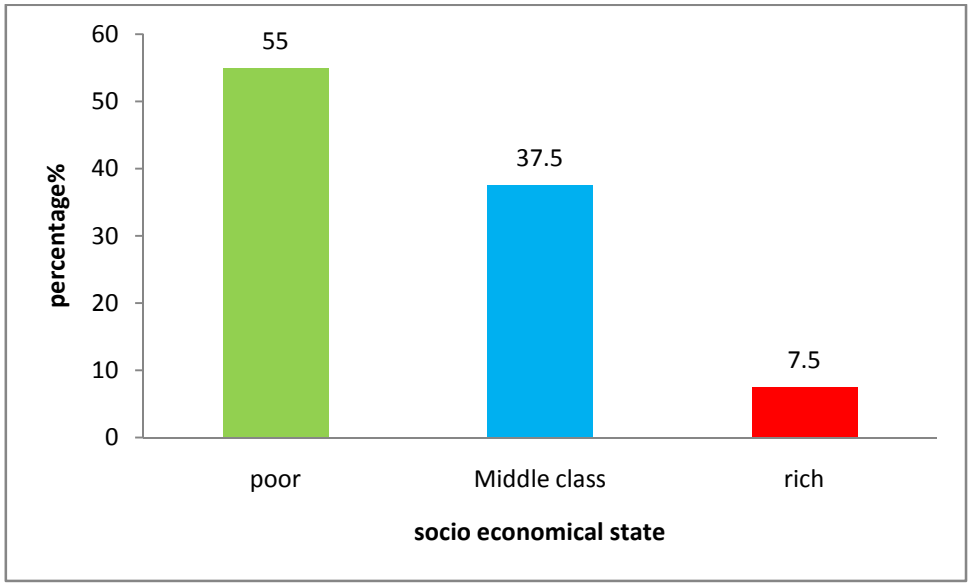


Inference

Among 40 cases, majority were from marutha nilam.

8. SOCIO-ECONOMIC STATUS

S.No	Class	No of Cases	Percentage (%)
1	Rich	3	7.5
2.	Middle - class	15	37.5
3.	Poor	22	55
	Total	40	100

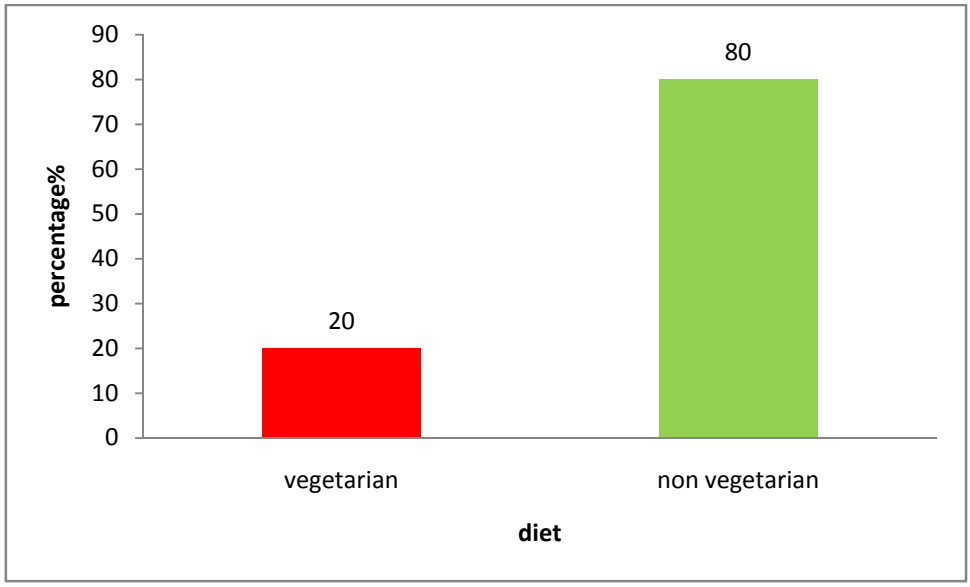


Inference

Out of 40 cases 55% of the cases were from poor socio-economic status, 37.5% cases were from middle class families and only 7.5% from Rich background.

9. DIETARY HABITS

S.No	Dietary	No of Cases	Percentage (%)
1	Vegetarian	8	20
2.	Non-vegetarian	32	80
	Total	40	100

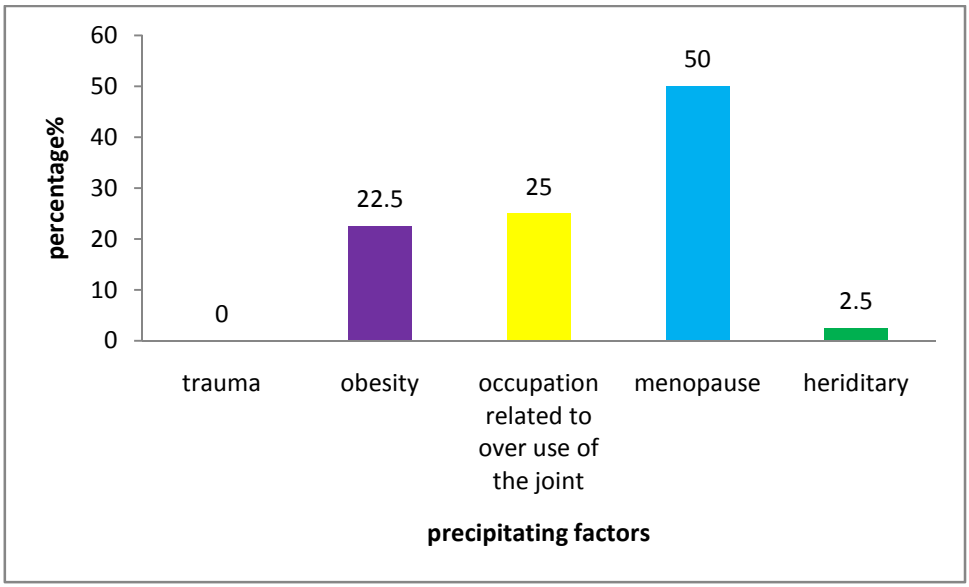


Inference

Most of the cases have non-vegetarian diet habit.

10. PRECIPITATING FACTORS

S.No	Precipitating factors	No of Cases	Percentage (%)
1	Trauma	0	0
2.	Obesity	9	22.5
3.	Occupation related overuse of the joint	10	25
4.	Menopause	20	50
5.	Hereditary	1	2.5
	Total	40	100

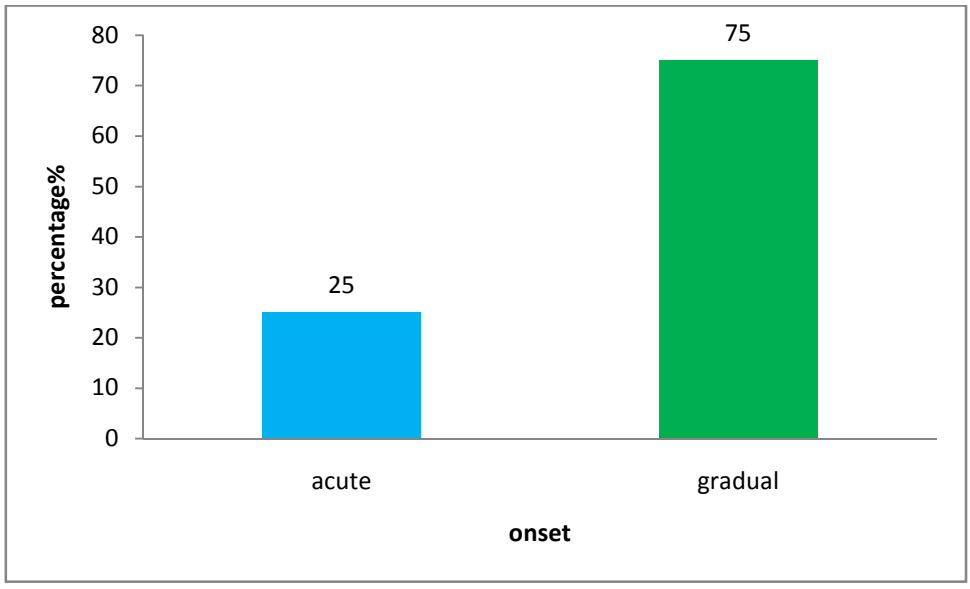


Inference

Among the 40 patients, 20 patients of them (50%) were in the post menopause stage, 10 of them (25%) had history of over use of the joints, 9 of them (22.5%) were obese, and 1 of them (2.5%) were hereditary.

11. MODE OF ONSET

S.No	Mode of onset	No of Cases	Percentage (%)
1	Acute	10	25
2.	Gradual	30	75
	Total	40	100

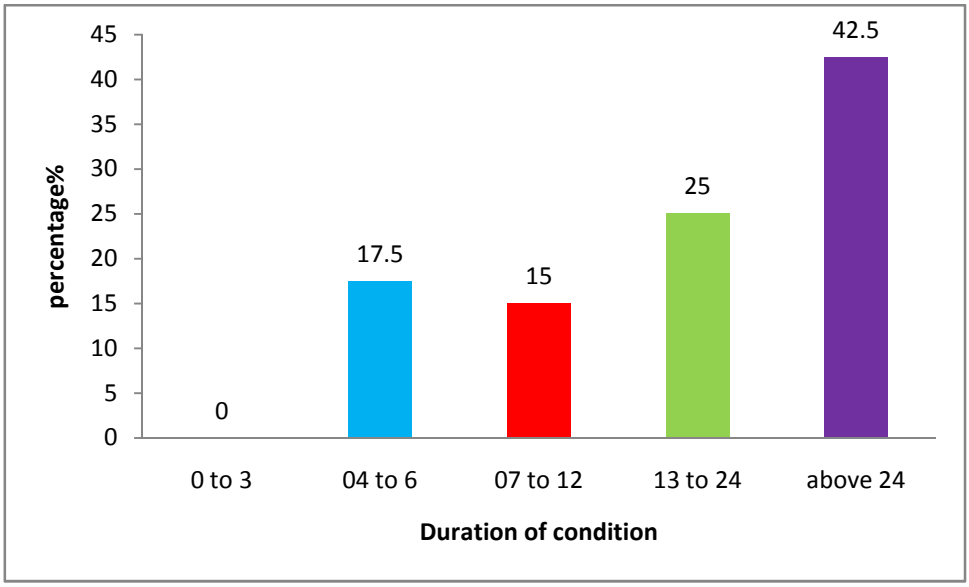


Inference

According to this study 75% of cases were reported gradual onset of disease.

12. DURATION OF CONDITIONS

S.No	Duration (Months)	No of Cases	Percentage (%)
1	0-3	0	0
2.	4-6	7	17.5
3.	7-12	6	15
4.	13-24	10	25
5.	Above 24	17	42.5
	Total	40	100

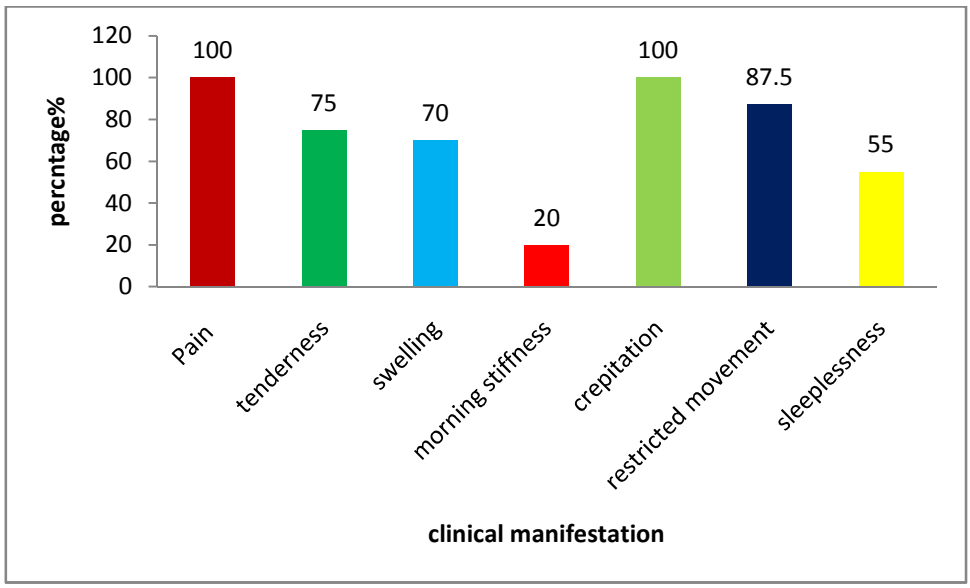


Inference

Among the 40 cases, 7 cases (17.5%) were come under 4-6 months, 6 cases (15%) were come under 7-12 months, 10 cases (25%) were come under 13-24 months and 17 cases (42.5%) were came beyond 24 months.

13. CLINICAL FEATURES

S.No	Clinical features	No of Cases	Percentage (%)
1	Pain	40	100
2.	Swelling	28	70
3.	Tenderness	30	75
4.	Morning stiffness	8	20
5.	Crepitation	40	100
6.	Deformity	7	17.5
7.	Restricted movements	35	87.5
8.	Sleeplessness	22	55



Inference

Pain, crepitation were found in all 40 cases (100%)

Swelling was found in 28 cases (70%)

Tenderness was found in 30 cases (75%)

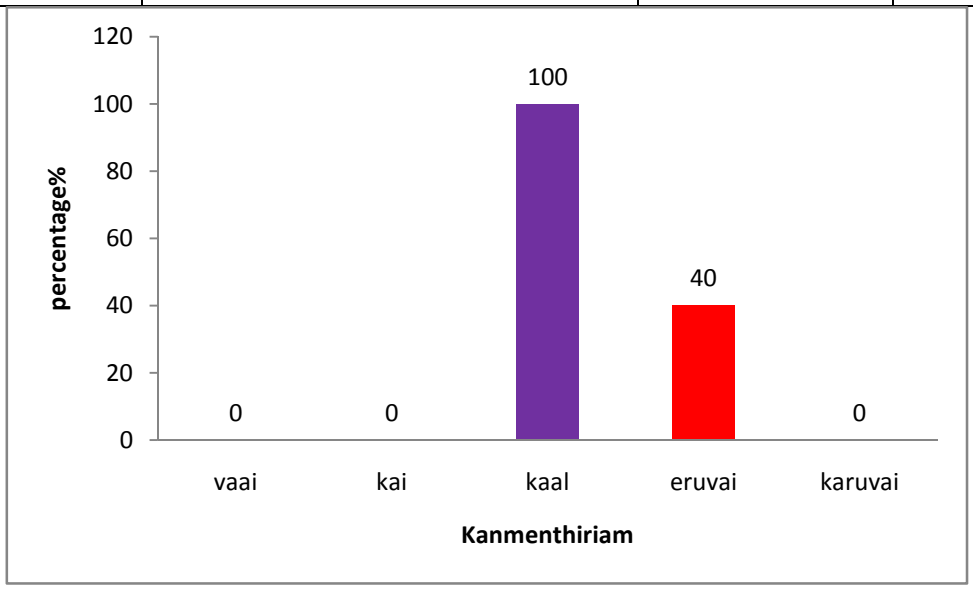
Restricted movements was found in 35 cases (87.5%)

Morning stiffness was found in 8 cases (20%)

Sleeplessness was found in 22 cases (55%).

14. CONFLICT IN KANMENTHIRIAM

S.No	Kanmenthiriam	No of Cases	Percentage (%)
1	Vaai	0	0
2.	Kai	0	0
3.	Kaal	40	100
4.	Eruvai	16	40
5.	Karuvaai	0	0

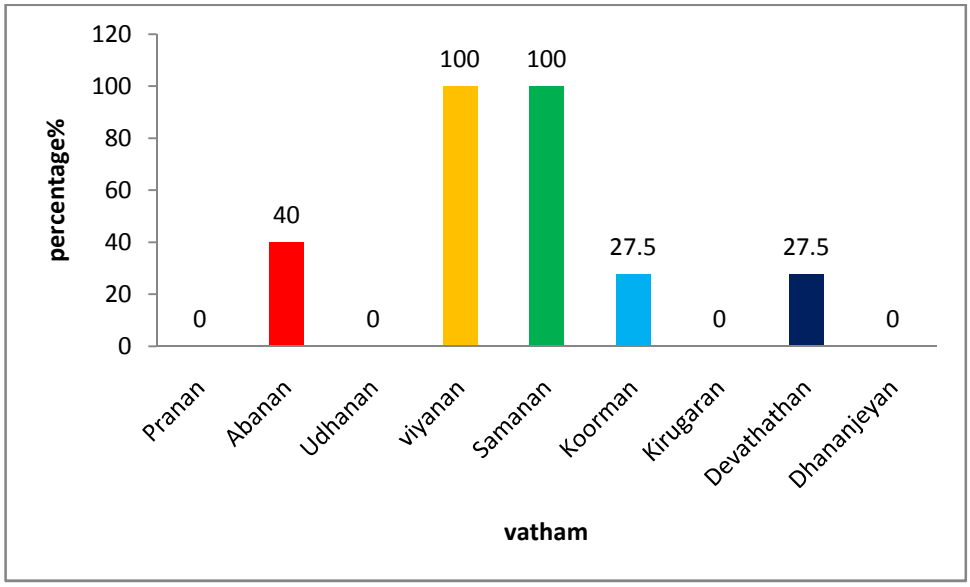


Inference

Among all the kanmenthiriam (Kai, kaal, vai, eruvai, karuvai) kaal was affect in all the 40 cases (100%) and Eruvai was affected in 16 cases (40%).

15. TABLE SHOWING THE DISTURBANCES IN VATHAM

S.No	Vatham	No of Cases	Percentage (%)
1	Pranan	0	0
2.	Abanan	16	40
3.	Udhanan	0	0
4.	Viyanan	40	100
5.	Samanan	40	100
6.	Nagan	0	0
7.	Koorman	0	0
8.	Kirukaran	11	27.5
9.	Devathathan	11	27.5
10.	Dhananjeyan	0	0

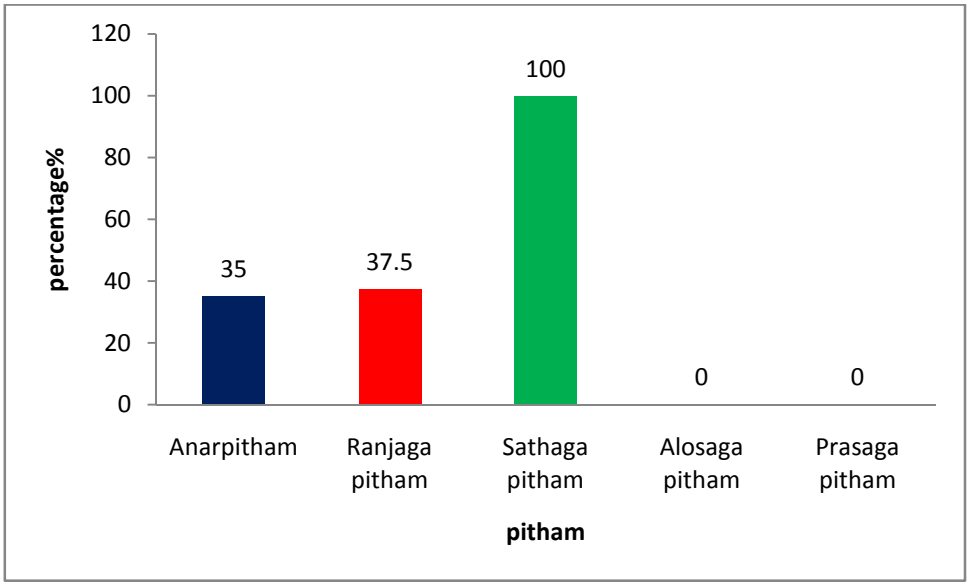


Inference

Viyanan and Samanan were affected in all the 40 cases (100%) Abanan were affected in 16 cases (40%) and Kirukaran and Devathathan affected in 11cases (27.5%).

16. DISTURBANCES IN PITHAM

S.No	Pitham	No of Cases	Percentage (%)
1	Anar pitham	14	35
2.	Ranjaga pitham	15	37.5
3.	Sathaga pitham	40	100
4.	Prasaga pitham	0	0
5.	Alosaga pitham	0	0

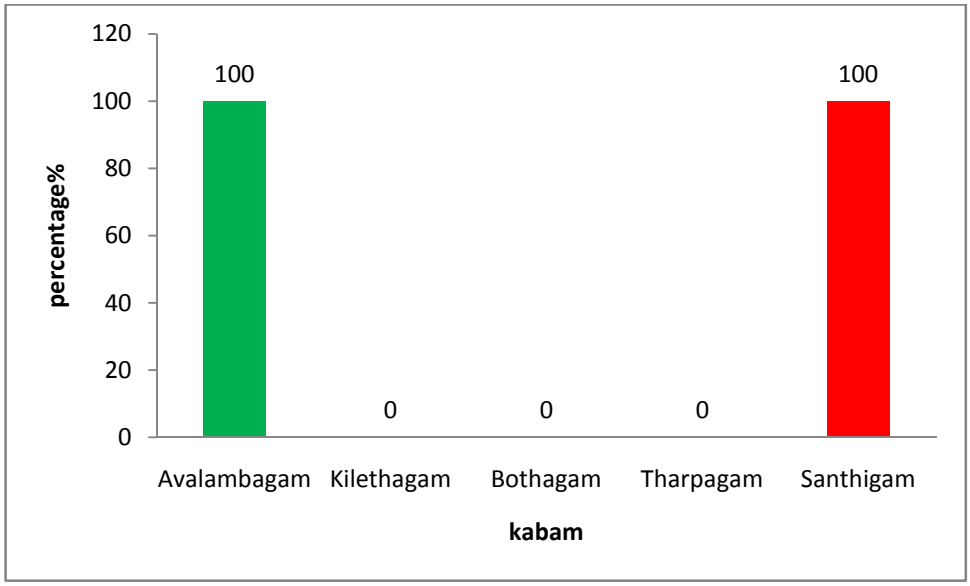


Inference

Sathaga Pitham was affected in all 40 cases (100%), Ranjagapitham was affected in 15 cases (37.5%) Anarpitham was affected in 14 cases (35%).

17. TABLE SHOWING THE DISTURBANCE OF KABAM

S.No	Kabam	No of Cases	Percentage (%)
1	Avalambagam	40	100
2.	Kilethagam	0	0
3.	Bothagam	0	0
4.	Tharpagam	0	0
5.	Santhigam	40	100

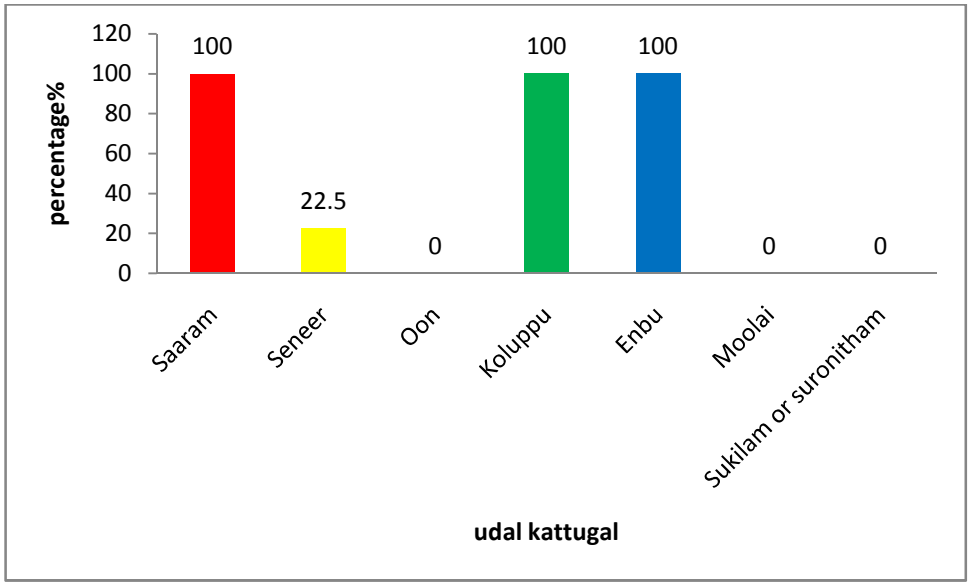


Inference

Among all Santhigam and avalambagam was affected in all 40 cases (100%)

18. DISTURBANCE IN UDAL KATTUGAL

S.No	Udal kattugal	No of Cases	Percentage (%)
1	Saaram	40	100
2.	Seneer	9	22.5
3.	Oon	0	0
4.	Kozhuppu	40	100
5.	Enbu	40	100
6.	Moolai	0	0
7.	Sukilam/suronidham	0	0

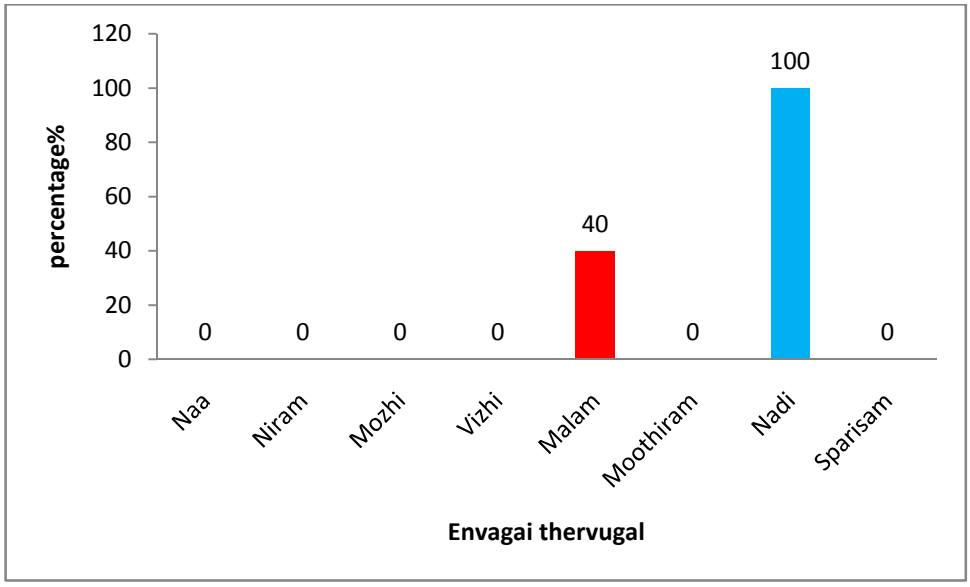


Inference

It was diagnosed, during the study that among the seven udalkattukal saaram, kozhuppu, Enbu were affected in 40 cases (100%) and seneer is affected in 9 cases (22.5%).

19. ENVAGAI THERVUGAL

S.No	Envagai thervugal	No of Cases	Percentage (%)
1	Naa	0	0
2.	Niram	0	0
3.	Mozhi	0	0
4.	Vizhi	0	0
5.	Malam	15	40
6.	Moothiram	0	0
7.	Sparisam	0	0
8.	Naadi	40	100



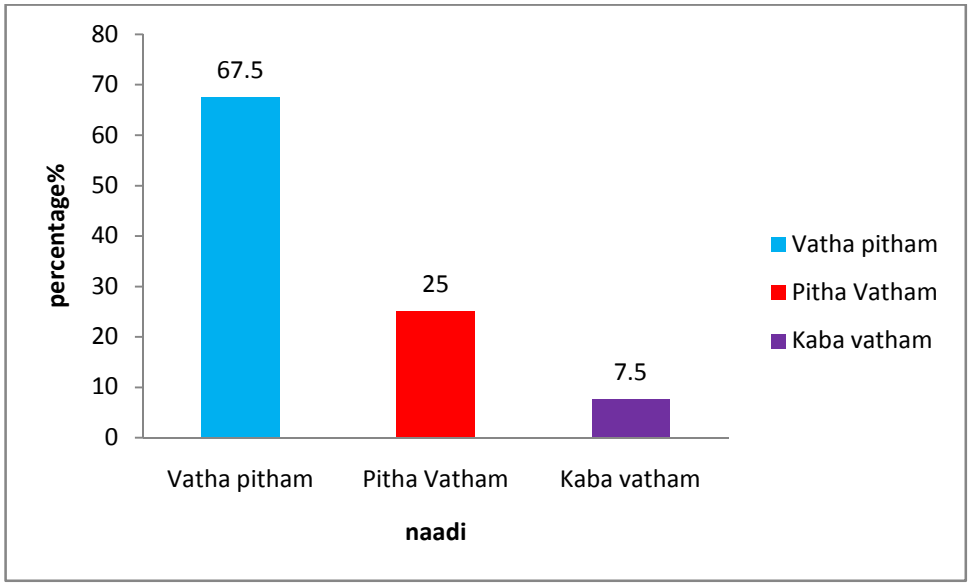
Inference

It was learnt during the study that Naadi was noted in all 40 cases (100%) Malam was affected in 15 cases (40%)

20. NAADI

Pulse reading (Naadi)

S.No	Parameters	No of Cases	Percentage (%)
1	Vathapitham	27	67.5
2.	Pitha vatham	10	25
3.	Kabavatham	3	7.5

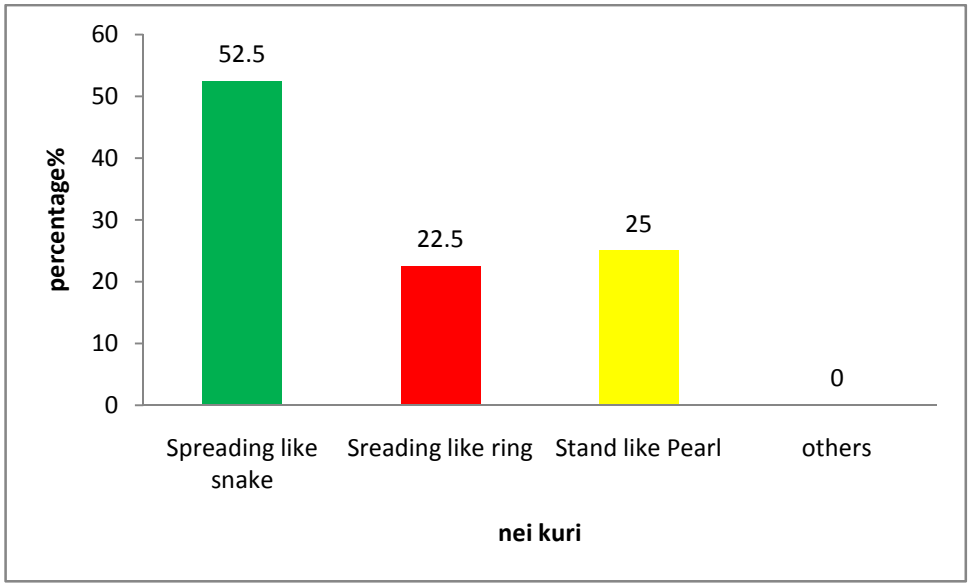


Inference

As mentioned above naadi was noted in all cases and among them 27 cases (67.5%) were vathapitha naadi, 10 cases (25) were pithavatha naadi and remaining 3 cases (7.5%) were kabavatha naadi.

21. NEIKURI

S.No	Inference	No of Cases	Percentage (%)
1	Spreading like snake	21	52.5
2.	Spreading like a ring	9	22.5
3.	Stands like a pearl	10	25
4.	Combination of ring and snake	0	0



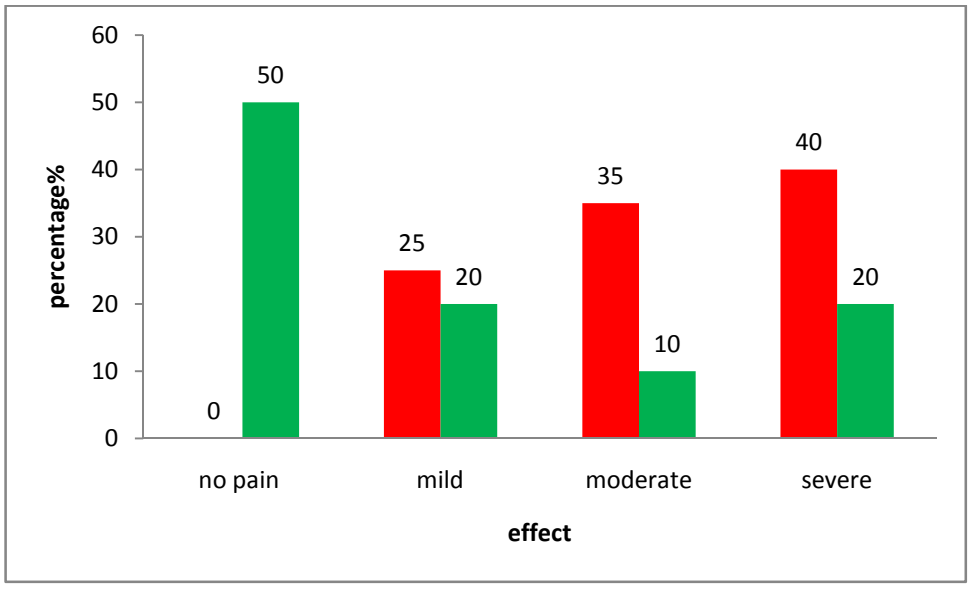
Inference

In Neikuri analysis, 52.5% of the cases presented with vatha neer, 22.5% with pithaneer, 25% with kaba neer .

TABLE 22. ASSESSMENT OF CURATIVE EFFECTS IN PATIENTS TREATED ONLY WITH TRAIL DRUG

(INTERNAL AND EXTERNAL MEDICINES)

symptoms	Initial readings		Final readings	
	No of patients	percentage	No of patients	Percentage
No pain	0	0	10	50
Mild	5	25	4	20
Moderate	7	35	2	10
severe	8	40	4	20

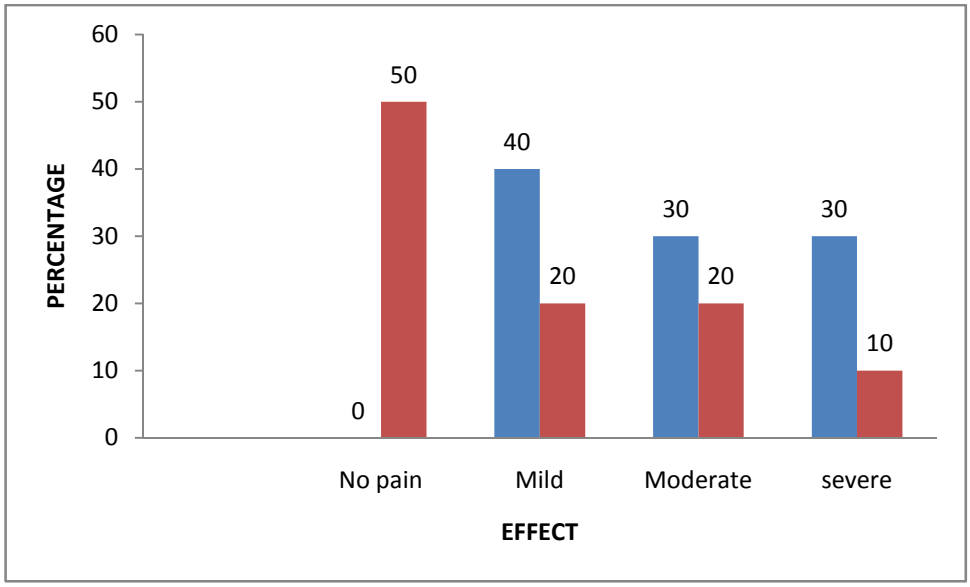


Inference

From the above study, it was inferred that severe pain that was noted in patients before treatment had a remarkable decline after treatment similarly moderate and mild pain were also observed to have decreased after treatment.

TABLE 23. ASSESSMENT OF CURATIVE EFFECTS IN OSTEOARTHRITIS PATIENTS TREATED WITH TRAIL DRUGS ALONG WITH COMPLIMENTARY THERAPY (YOGA)

symptoms	Initial readings		Final readings	
	No of patients	percentage	No of patients	Percentage
No pain	0	0	5	50
Mild	4	40	2	20
Moderate	3	30	2	20
severe	3	30	1	10

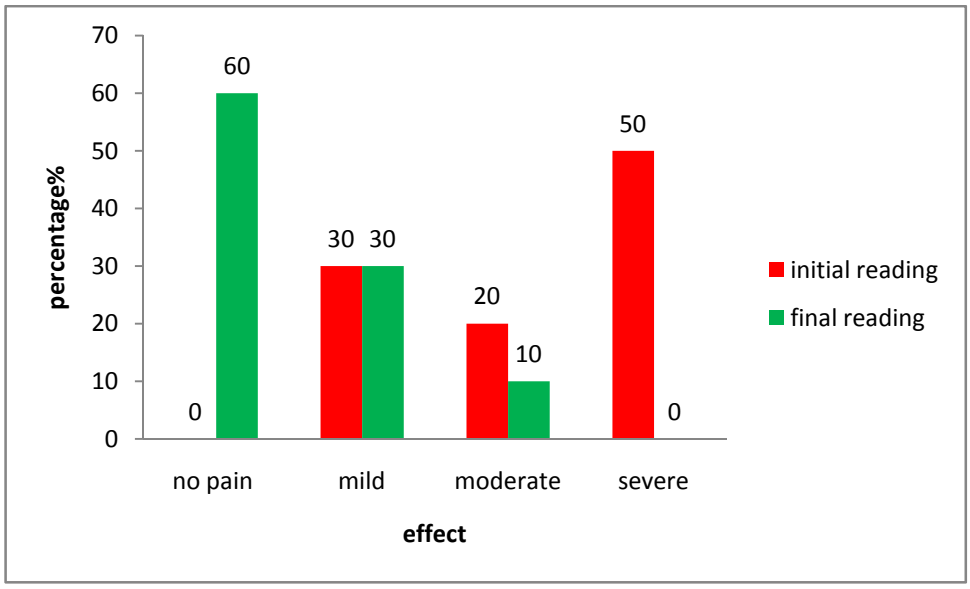


Inference

Administration of trial drug along with complementary therapy reduced severe pain almost all the cases also in mild and moderate cases were notably reduced.

TABLE 24. ASSESSMENT OF CURATIVE EFFECTS IN OSTEOARTHRITIS PATIENTS TREATED WITH TRAIL DRUGS. ALONG WITH COMPLEMENTARY THERAPY (VARMAM)

symptoms	Initial readings		Final readings	
	No of patients	Percentage	No of patients	Percentage
No pain	0	0	6	60
Mild	3	30	3	30
Moderate	2	20	1	10
severe	5	50	0	0

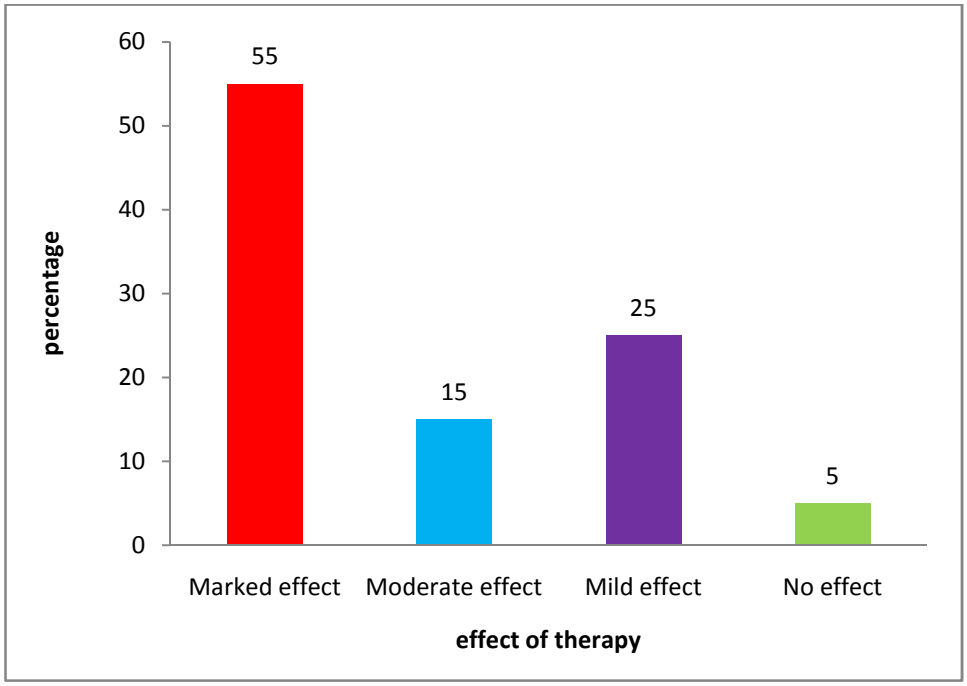


Inference

Administration of trial drug along with complementary therapy reduced severe pain in almost all the cases, mild and moderate cases were notably reduced.

TABLE 25. EFFECT OF TRAIL DRUG ALONG WITH COMPLEMENTARY THERAPIES

S.no	Effect of therapy	No. Of patients	Percentage(%)
1	Marked effect	11	55
2	Moderate effect	3	15
3	Mild effect	5	25
4	No effect	1	5

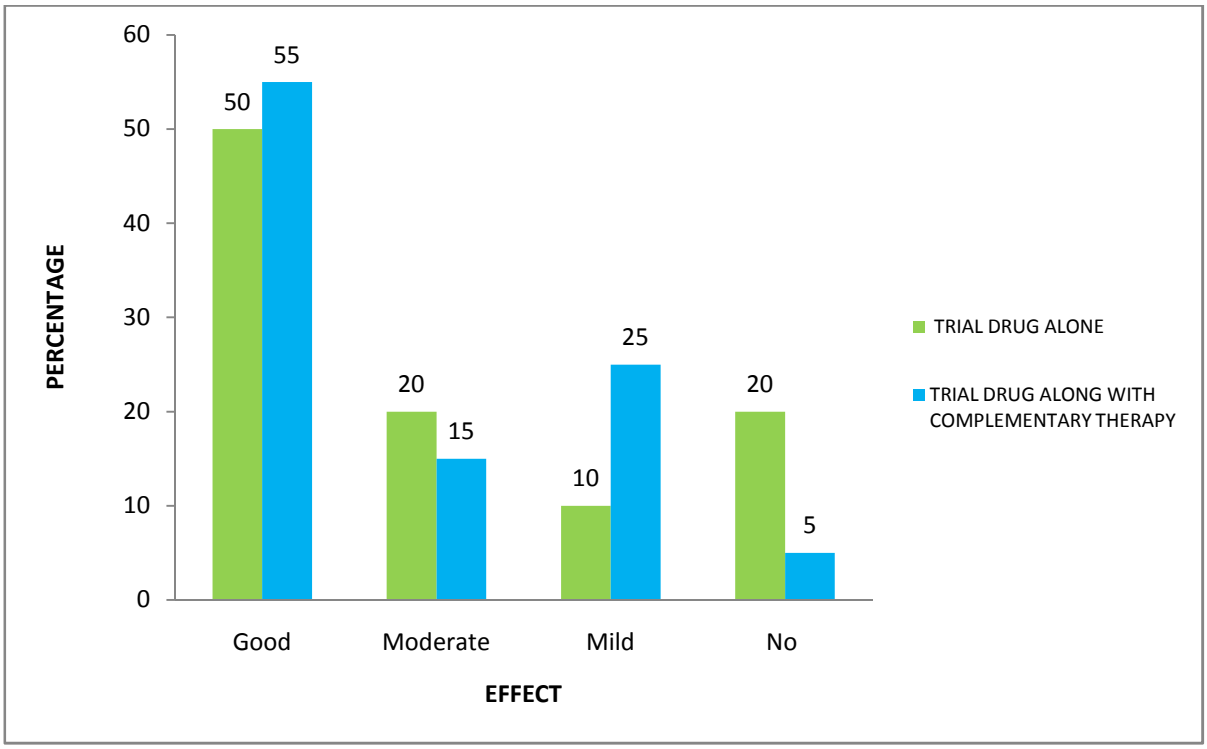


Inference

Administration of trial drug along with complementary therapies had 55% good effect, 15% moderate effect and 25% mild effect and 5 % no effect.

TABLE 26. COMPARISON BETWEEN EFFECTIVE OF TRAIL DRUG AND TRAIL DRUG WITH COMPLEMENTARY THERAPIES

S.no	Effect of therapy	Trail drug alone		Trail drug with external therapy	
		No.Of cases	percentage	No.Of cases	percentage
1	Good	10	50	11	55
2	Moderate	4	20	3	15
3	Mild	2	10	5	25
4	No	4	20	1	5

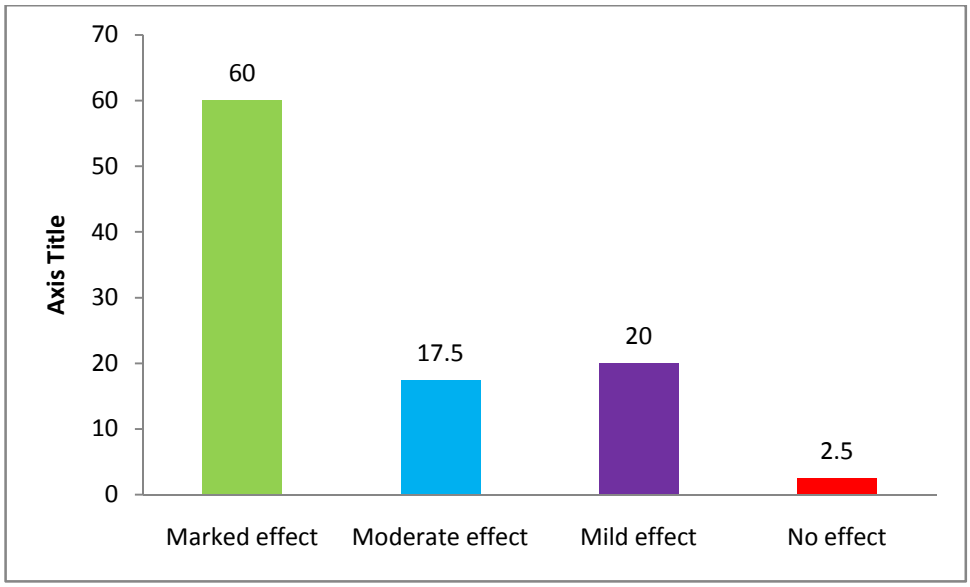


Inference:

In comparative study , the trial drug with external therapy is more effective than trial drug alone.

TABLE 27. EFFECT OF THERAPY

S.no	Effect of therapy	No. Of patients	Percentage(%)
1	Marked effect	24	60
2	Moderate effect	7	17.5
3	Mild effect	8	20
4	No effect	1	2.5



Inference

Thus from the analysis of the data collected during the course of treatment and at the end of treatment it is inferred that the overall effect of the therapy (internal, external and complementary) had marked effect of 60%, moderate effect of 17.5% and mild effect of 20% ,no effect of 2.5%.

MEASUREMENT OF THE KNEE JOINTS

S.NO	PATIENT NAME	AGE/SEX	OP/IP NO	BEFORE TREATMENT		AFTER TREATMENT	
				Right (cm)	Left (cm)	Right(cm)	Left(cm)
1	Palaniyammal	60/f	3358	35	33	31	30
2	Jeyanthi	43/f	113318	38	36	34	33
3	Raja lakshmi	60/f	1194	39	38	33	32
4	Kala	56/f	5669	34	33	30	30
5	Poovaiya	55/m	2942	35	32	33	29
6	Sherina	57/f	9038	36	35	32	31
7	Chendhura paundiyan	58/m	2154	33	32	29	30
8	Valliyammal	48/f	114833	40	39	35	34
9	Iyyam perumal	60/m	114059	32	35	28	27
10	Meera	46/f	12319	31	33	26	28
11	Anaikarai muthu	56/m	548	41	39	38	37
12	Kaliyappan	52/m	46	38	31	36	33
13	Anuthai	52/f	233	39	37	36	33
14	Mariyammal	41/f	380	30	37	28	35
15	Sagunthala	43/f	5986	24	28	22	26
16	Nadarajan	60/m	430	33	30	31.5	28
17	mariyammal	45/f	10363	34	31	33	27
18	Ramalingam	54/m	11323	35	32	31	30
19	Kuruvammal	60/f	1115	37	36	33	30
20	Shanmugasuntharam	55/m	12388	40	38	38	35.5

INFERENCE: Knee joint swelling is reduced approximately 2-3 cms after treatment.

CASE PRESENTATION – SUMMARY OF OUT PATIENTS

1. KANDATHIRI LEGHIYAM – INTERNAL 2.NAKKA PUSA MUKKUTTENNAI – EXTERNAL

S.no	Op.no	Name	Age/sex	Occupation	Date of registration	Date of completion of treatment	No. Of days treated	Result
1	110149	Navamani	59/m	Farmer	14-12-17	02-02-18	49	MODERATE
2	113318	Jeyanthi	43/f	House wife	23-12-17	02-02-18	42	MILD
3	114833	Valliyammal	48/f	House wife	28-12-17	16-02-18	48	MARKED
4	114059	Iyyam perumal	60/m	Farmer	29-12-17	02-02-18	35	MARKED
5	1759	Rasammal	50/f	House wife	04-01-18	20-02-18	48	MODERATE
6	5669	Kala	56/f	House wife	17-01-18	27-02-18	42	MARKED
7	5810	Jeyarani	52/f	Teacher	17-01-18	25-02-18	42	MILD
8	5986	Sagunthala	43/f	Teacher	17-01-18	21-01-18	35	MARKED
9	7792	Krishnaveni	59/f	House wife	23-01-18	06-03-18	42	MODERATE
10	7905	Subbuthai	50/f	House wife	23-01-18	12-03-18	48	MARKED
11	8584	Fathima	40/f	House wife	25-01-18	08-03-18	42	MARKED
12	9038	Sherina	57/f	House wife	26-01-18	08-03-18	42	MILD
13	10280	Umayammal	60/f	House wife	30-01-18	12-03-18	42	MARKED
14	10363	mariyammal	45/f	House wife	30-01-18	12-03-18	42	MARKED
15	11323	Ramalingam	54/m	Formar	02-02-18	22-03-18	48	MODERATE
16	12071	Inthira	56/f	House wife	05-02-18	19-03-18	42	MARKED
17	12319	Meera	46/f	Teacher	05-02-18	12-03-18	36	MILD
18	12388	Shanmugasuntharam	55/m	Farmer	05-02-18	19-03-18	42	MARKED
19	13389	Sowntharajan	58/m	Farmer	08-02-18	28-03-18	48	MARKED
20	13480	Sutha	42/f	Teacher	08-02-18	28-03-18	48	MILD

LIST OF IN PATIENTS OF PG III SIRAPPU MARUTHUVAM DEPARTMENT GIVEN

1.KANDATHIRI LEGHIYAM – INTERNAL 2.NAKKA PUSA MUKKUTTENNAI – EXTERNAL

S.NO	IP.NO	NAME	AGE/SEX	OCCUPATION	DATE OF ADMISSION	DATE OF DISCHARGE	TOTAL NO. OF DAYS TREATED		TOTAL NO. OF DAYS	RESULT
							IP	OP		
1	2004	Ashwathi	52/f	House wife	11-07-17	16-08-17	37	11	48	MARKED
2	2115	Maharasi	55/f	House wife	25-07-17	29-08-17	36	12	48	MARKED
3	2154	Chendhura paundiyan	58/m	Farmer	30-07-17	16-08-17	17	31	48	MODERATE
4	2942	Poovaiya	55/m	Farmer	21-10-17	21-11-17	32	16	48	MARKED
5	3094	Velammal	51/f	House wife	20-11-17	18-12-17	29	19	48	MILD
6	3285	Sornam	59/f	House wife	15-12-17	09-01-18	26	22	48	MARKED
7	3358	Palaniyammal	60/f	House wife	27-12-17	10-02-18	46	2	48	MODERATE
8	46	Kaliyappan	52/m	Farmer	08-01-18	26-02-18	49	0	48	MARKED
9	233	Anuthai	52/f	House wife	30-01-18	14-03-18	46	2	48	MILD
10	380	Mariyammal	41/f	House wife	13-02-18	01-03-18	17	31	48	MARKED
11	383	Lakshmi	60/f	House wife	14-02-18	16-03-18	28	20	48	MODERATE
12	389	Pon selvi	48/f	House wife	14-02-18	16-03-18	28	20	48	MARKED
13	430	Nadarajan	60/m	Farmer	23-02-18	18-03-18	29	19	48	MILD
14	533	Ponnuthai	60/f	House wife	27-02-18	15-03-18	17	31	48	NO EFFECT
15	548	Anaikarai muthu	56/m	Farmer	28-02-18	29-03-18	30	18	48	MARKED
16	838	Vasugi	40/f	House wife	27-03-18	17-04-18	22	26	48	MARKED
17	1045	Annamalai	60/f	House wife	17-04-18	05-06-18	50	0	48	MARKED
18	1073	Pandiyaraj	33/m	Masson	19-04-18	22-05-18	34	14	48	MARKED
19	1115	Kuruvammal	60/f	House wife	24-04-18	29-07-18	35	13	48	MARKED
20	1194	Raja lakshmi	60/f	House wife	03-05-18	11-06-18	37	11	48	MARKED

BLOOD INVESTIGATION BEFORE AND AFTER TREATMENT – OP PATIENT

S.NO	OP.NO	TC		DC										HB		ESR		BLOOD SUGAR				BLOOD UREA		SERUM CHOLESTEROL	
				N		L		E		B		M						F		PP					
		BT	AT	BT	AT	BT	AT	BT	AT	BT	AT	BT	AT	BT	AT	BT	AT	BT	AT	BT	AT	BT	AT	BT	AT
1	110149	7500	8100	64	67	29	29	7	4	0	0	0	0	12.1	12.4	15	10	97	92	149	135	28	27	185	176
2	113318	7400	7600	72	69	25	28	3	3	0	0	0	0	13.1	13	22	19	124	118	168	155	40	31	208	201
3	114833	7200	7500	64	63	32	34	4	3	0	0	0	0	9.5	9.9	28	19	99	90	149	132	29	22	159	149
4	114059	7800	7400	65	64	31	32	4	4	0	0	0	0	9.6	10.1	34	25	108	102	189	172	36	22	221	201
5	1759	7500	7600	59	61	36	34	5	5	0	0	0	0	12.5	12.7	25	20	96	92	176	140	34	29	179	177
6	5669	7700	7300	62	64	32	34	6	2	0	0	0	0	13.5	13.6	31	23	122	108	154	146	37	31	167	157
7	5810	6900	6700	59	61	37	36	4	3	0	0	0	0	12.2	12.4	19	11	136	127	179	161	22	19	196	187
8	5986	8200	7900	69	69	28	29	3	2	0	0	0	0	12.8	12.9	32	21	142	128	165	148	35	32	139	165
9	7792	8000	8100	64	62	33	36	3	2	0	0	0	0	11.8	11.9	25	11	127	167	156	29	34	29	179	149
10	7905	7300	7100	66	67	33	31	1	2	0	0	0	0	13.5	13.7	28	19	99	90	149	132	29	22	159	149
11	8584	7800	7700	59	61	37	36	4	3	0	0	0	0	12.2	12.4	27	20	106	97	167	165	37	34	186	172
12	9038	7100	6900	64	62	33	36	3	2	0	0	0	0	11.8	13.6	15	10	97	92	149	135	28	27	185	176
13	10280	8800	8400	63	65	35	34	2	1	0	0	0	0	12.2	12.4	19	11	129	117	179	161	22	19	186	174
14	10363	8400	7900	64	63	32	34	4	3	0	0	0	0	9.5	9.9	34	28	89	85	149	140	34	29	179	165
15	11323	7300	7100	71	69	24	28	3	3	0	0	0	0	13.5	13.7	28	19	99	90	149	132	29	22	159	149
16	12071	7200	7500	59	61	36	34	5	5	0	0	0	0	12.5	12.7	25	19	136	127	167	156	29	25	196	185
17	12319	6900	6700	64	62	33	36	3	2	0	0	0	0	11.8	11.9	25	20	96	92	176	168	29	22	199	187
18	12388	7800	7500	69	67	28	31	3	2	0	0	0	0	12.2	12.4	19	11	99	90	149	132	29	22	159	149
19	13389	9200	9000	70	70	26	25	4	5	0	0	0	0	10.9	11.1	30	19	136	128	159	139	42	37	165	157
20	13480	6700	6900	61	62	34	34	5	4	0	0	0	0	11.8	12.2	26	18	121	118	172	159	19	15	194	188

BLOOD INVESTIGATION BEFORE AND AFTER TREATMENT – IP PATIENT

S.NO	IP.NO	TC		DC										HB		ESR		BLOOD SUGAR				BLOOD UREA		SERUM CHOLESTEROL	
				N		L		E		B		M						F		PP					
		BT	AT	BT	AT	BT	AT	BT	AT	BT	AT	BT	AT	BT	AT	BT	AT	BT	AT	BT	AT	BT	AT	BT	AT
1	2004	7100	7500	66	67	33	31	1	2	0	0	0	0	13.5	13.7	28	19	99	98	130	133	29	22	159	149
2	2115	7300	7600	59	61	37	36	4	3	0	0	0	0	12.2	12.4	27	20	86	90	132	135	37	34	186	172
3	2154	7600	7400	64	62	33	36	3	2	0	0	0	0	11.8	13.6	15	10	87	90	126	125	28	27	185	176
4	2942	7700	7800	65	64	31	32	4	4	0	0	0	0	9.6	10.1	34	25	80	82	130	132	36	22	221	201
5	3094	7400	7600	71	69	24	28	3	3	0	0	0	0	12.2	12.4	11	99	88	85	132	136	29	25	196	185
6	3285	7900	7700	59	61	36	34	5	5	0	0	0	0	12.2	12.4	19	136	89	87	139	140	29	22	199	187
7	3358	6700	6900	64	62	33	36	3	2	0	0	0	0	9.5	9.9	11	136	79	85	127	128	34	29	179	177
8	46	8100	8500	69	69	28	29	3	2	0	0	0	0	12.8	12.9	32	21	89	88	130	138	35	32	139	165
9	233	8300	8400	64	62	33	36	3	2	0	0	0	0	11.8	11.9	25	11	90	88	136	138	34	29	179	149
10	380	7100	7300	69	67	28	31	3	2	0	0	0	0	12.2	12.4	19	11	87	90	120	130	29	22	159	149
11	383	7700	7800	70	70	26	25	4	5	0	0	0	0	10.9	11.1	30	19	86	88	127	139	42	37	165	157
12	389	7000	7200	59	61	37	36	4	3	0	0	0	0	12.2	12.4	19	11	83	87	130	136	22	19	196	187
13	430	7800	8000	63	65	35	34	2	1	0	0	0	0	12.2	12.4	19	11	79	77	125	126	22	19	186	174
14	533	7400	7500	64	63	32	34	4	3	0	0	0	0	9.5	9.9	34	28	89	85	123	138	34	29	179	165
15	548	6300	6500	71	69	24	28	3	3	0	0	0	0	13.5	13.7	28	19	79	88	130	134	29	22	159	149
16	838	7100	7300	59	61	36	34	5	5	0	0	0	0	12.5	12.7	25	19	89	87	132	137	29	25	196	185
17	1045	6700	6900	64	62	33	36	3	2	0	0	0	0	11.8	11.9	25	20	95	92	129	134	29	22	199	187
18	1073	7500	7700	59	61	36	34	5	5	0	0	0	0	12.5	12.7	24	23	98	96	130	133	34	29	179	177
19	1115	7200	7500	62	64	32	34	6	2	0	0	0	0	13.5	13.6	31	23	82	90	135	140	37	31	167	157
20	1194	6800	7000	61	62	34	34	5	4	0	0	0	0	11.8	12.2	26	18	81	88	126	130	19	15	194	188

URINE EXAMINATION BEFORE & AFTER TREATMENT – OUT PATIENTS

S.no	Op.no	Before treatment			After treatment		
		Albumin	Sugar	Deposit	Albumin	Sugar	Deposit
1	110149	NIL	NIL	NAD	NIL	NIL	NAD
2	113318	NIL	NIL	NAD	NIL	NIL	NAD
3	114833	NIL	NIL	NAD	NIL	NIL	NAD
4	114059	TRACE	NIL	1-2 PUS CELLS	NIL	NIL	NAD
5	1759	NIL	NIL	NAD	NIL	NIL	NAD
6	5669	NIL	NIL	NAD	NIL	NIL	NAD
7	5810	NIL	NIL	NAD	NIL	NIL	NAD
8	5986	NIL	NIL	NAD	NIL	NIL	NAD
9	7792	NIL	NIL	NAD	NIL	NIL	NAD
10	7905	NIL	NIL	NAD	NIL	NIL	NAD
11	8584	NIL	NIL	NAD	NIL	NIL	NAD
12	9038	NIL	NIL	NAD	NIL	NIL	NAD
13	10280	NIL	NIL	NAD	NIL	NIL	NAD
14	10363	NIL	NIL	NAD	NIL	NIL	NAD
15	11323	NIL	NIL	NAD	NIL	NIL	NAD
16	12071	TRACE	NIL	1-3 PUS CELLS	NIL	NIL	NAD
17	12319	NIL	NIL	NAD	NIL	NIL	NAD
18	12388	NIL	NIL	NAD	NIL	NIL	NAD
19	13389	NIL	NIL	NAD	NIL	NIL	NAD
20	13480	NIL	NIL	NAD	NIL	NIL	NAD

RINE EXAMINATION BEFORE & AFTER TREATMENT – IN PATIENTS

S.no	Ip.no	Before treatment			After treatment		
		Albumin	Sugar	Deposit	Albumin	Sugar	Deposit
1	2004	NIL	NIL	NAD	NIL	NIL	NAD
2	2115	Trace	NIL	2-3 pus cells	Trace	NIL	NAD
3	2154	NIL	NIL	NAD	NIL	NIL	NAD
4	2942	NIL	NIL	NAD	NIL	NIL	NAD
5	3094	NIL	NIL	NAD	NIL	NIL	NAD
6	3285	NIL	NIL	NAD	NIL	NIL	NAD
7	3358	NIL	NIL	NAD	NIL	NIL	NAD
8	46	NIL	NIL	NAD	NIL	NIL	NAD
9	233	NIL	NIL	NAD	NIL	NIL	NAD
10	380	NIL	NIL	NAD	NIL	NIL	NAD
11	383	NIL	NIL	NAD	NIL	NIL	NAD
12	389	NIL	NIL	NAD	NIL	NIL	NAD
13	430	NIL	NIL	NAD	NIL	NIL	NAD
14	533	NIL	NIL	NAD	NIL	NIL	NAD
15	548	NIL	NIL	NAD	NIL	NIL	NAD
16	838	Trace	NIL	1-2 pus cells	NIL	NIL	NAD
17	1045	NIL	NIL	NAD	NIL	NIL	NAD
18	1073	NIL	NIL	NAD	NIL	NIL	NAD
19	1115	NIL	NIL	NAD	NIL	NIL	NAD
20	1194	NIL	NIL	NAD	NIL	NIL	NAD

DISCUSSION

Osteoarthritis is a chronic disorder of synovial joints in which there is progressive softening and disintegration of articular cartilage and bone at the joint margins (osteophytes), cyst formation and subchondral sclerosis, mild synovitis and capsular fibrosis.

Classified as

Primary (localized or generalized)

Secondary (Traumatic, congenital, metabolic)

- Characterized by focal and progressive loss of hyaline cartilage of joints, underlying bony changes.

Symptoms

- Pain
- Swelling
- Stiffness

The trial drug given below was used in treating the disease azhal Keel vayu the trial drugs are

KANDATHIRI LEGHIYAM - Internal

NAKKA PUSA MUKKUTENNAI-External

The clinical approval was done as per the protocol and the data were collected by using approved forms. The disease Azhal Keel vayu (Osteoarthritis of knee joint) was considered under various criteria to gather the secondary objectives of the study and the results were observed and tabulated. A variety of criteria and the results were discussed here under.

Gender distribution

From the above mentioned tabulation, Among the 40 patients selected, 72.5% were female and 27.5% were male.

Age distribution

Among the 40 patients selected this study shows high incidence of Azhal Keel vayu (Osteoarthritis of knee joint) was in above 51-60 yrs (65%) of age, Azhal Keel vayu which is compared with osteoarthritis of knee joint which is degenerative disease, so the above interference explained it's significant as the age plays an important role upon the degenerative disease.

Kaalam distribution

From the above mentioned tabulation, Among the 40 patients selected in this study. Its shows the higher incidence was initiated to be pitha kaalam (97.5%).

Occupational status

In this study the rate of incidence is higher in occupational group which includes Housewives (62.5%), Farmer and Labour (25%) and carpenter, Mason (2.5%),Teacher (10%) This study shows heavy work housewives are mostly affected.

Seasonal variations

From the above mentioned tabulation 38 patients 95% were admitted in Munpani kaalam, 2 patients 5% were admitted in Koothirkaalam. Mostly the patients were admitted in Munpani kaalam.

Thinai

From the above mentioned tabulation. 34 cases (85%) were from Marutham and 3 cases (7.5%) were from Kurinji and 3 cases (7.5%) were from Neithal thinai.

Even though siddha literatures mention Marutham as a disease free zone, most of the patients came from Marutham Nilam. This may be due to the altered lifestyle, environment and food habits. Since this is a single centered study, located in Marutham thinai, it may also have influenced the study.

Socio-economic status

From the above mentioned tabulation, Out of 40 patients 55% were from low socio-economic status (poor), 37.5% were middle class, and 7.5% were rich. This higher incidence in the low socio-economic status may be due to over usage by farmer and manual worker among the poor. The incidence in the further population group may be due to improper nutrition and also the people living in poor sanitation.

Dietary habits

From the above mentioned tabulation patients 80% were reported to have mixed diet 8 patients 20% were reported vegetarian. So this has no statistically significant results.

Precipitating factors

From the mentioned above tabulation result that the Menopause 50%, the occupation relation 25% ,obesity 22.5% and Hereditary 2.5% were the most important precipitating factors.

Mode of onset

From the above mentioned tabulation it shows that 75% of the cases were reported to be having gradual onset.

Since osteoarthritis is a degenerative disorder it usually has a gradual onset of symptoms.

Clinical features

According to this study, 100% of them had pain, crepitation, 75% of them had tenderness, swelling 70%, Restricted movement 87.5% patient had sleeplessness 55%,

Disturbances in kanmenthiriam

From the above mentioned tabulation, among 40 patients kaal have been affected in 100% of cases and in 16 patients eruvai have been affected (40%).

Distribution of Three Dhosham

Derangement in Vatham

Viyanan and Samanan were affected in all 40 cases (100%). Abanan were affected in 16 cases (40%) and kirukaran and Devathathan affected in 11 cases (27.5%)

Derangement in Pitham

Sathaga pitham was affected in all 40 cases (100%) Ranjagapitham was affected in 15 cases (37.5%), Anarpitham was affected in 14 cases (35%).

Derangement in kabam

Avalambagam,Santhigam was affected in all 40 cases (100%).

Udal kattukal

In all 40 cases, among the seven udal kattukal saaram, Kozhuppu, Enbu were found affected 100% (Restricted movements, swelling, crepitations present) and and senneer is affected in 9 cases (22.5%).

Envagai Thervugal

The analysis showed the efficacy of this method and the prime importance of Naadi.

Among the 40 cases Naadi have been affected in all cases while malam have affected in 15 cases (40%)

Naadi

In Naadi, among all 27 cases (67.5%) were vathapitha naadi, 10 cases (25%) were pithavatha naadi and remaining 3 cases (7.5%) were having kabavatha naadi.

Neikuri

In Neikuri analysis, 52.5% of the cases presented with vatha neer, 22.5% with pithaneer, and 25% with kabaneer.

Laboratory investigations were done in all the cases before and after treatment. The significant variations occur in parameters like Hb, while other parameters have insignificant variation.

Pre-clinical studies

The Biochemical study of KANDATHIRI LEGHIYAM had revealed the presence of Calcium, chloride, starch, Iron (ferrous), Unsaturated compound, Reducing sugar, Amino acid.

Pharmacological studies

The pharmalogical studies done in KANDATHIRI LEGHIYAM revealed the presence of actions such as

1. Anti inflammatory action
2. Analgesic activity.

Toxicity studies

Acute toxicity and sub acute studies have done for KANDATHIRI LEGHIYAM in rats and it is analyzed that they have no toxicity.

Treatment

The treatment was aimed to retain the deranged dhosham and providing relief from symptoms. Before treatment the patients were advised to take Vellai ennai – 15ml with hot water during early morning in empty stomach for first day of treatment. The patients was asked to take rest from internal medicine and other activities on that day. From the next day, onward the internal medicine to be given.

The author treated the patients with trial drugs KANDATHIRI LEGHIYAM (Internal Medicine) 6gms BD and NAKKA PUSA MUKKUTTENNAI(External Medicine). During treatment, the patients were advised to follow pathiyam (avoid tamarind, tubers, meat etc). But all aspects of pathiyam could not be imposed due to practical difficulties.

SUMMARY

Osteoarthritis is the most common form of arthritis. It causes pain, swelling and reduced motion in joints.

I have taken this as my dissertation and treated with KANDATHIRI LEGHIYAM as internal medicine and NAKKA PUSA MUKKUTTENNAI as external medicine in azhal keel vayu (Osteo arthritis of knee joint).

40 cases with azhal keel vayu were diagnosed clinically and admitted in the Inpatient ward and Outpatient ward of Post graduate department of Sirappu Maruthuvam, Government Siddha Medical College hostpital, Palayamkottai and treated by the trial medicines.

- Laboratory diagnosis of azhal keel vayu was done by siddha diagnostic principles and endorsed by modern methods of investigations.
- The various siddha aspects of examination of the disease were carried out and were recorded in the proforma.
- The trial medicine chosen for both internal and external treatment were KANDATHIRI LEGHIYAM in 6 grm twice a day for forty eight days as per the severity of the diseases, NAKKA PUSA mukuttuennai(External).
- Before starting the treatment careful detailed history was carried out and recorded for the forty selected cases.
- During the period of treatment all the patients were put under pathiyam (A specific dietary regimen).
- A periodical laboratory investigation was made for all the cases along with the radiological investigations.
- The observations made during the clinical study shows that the main internal drug KANDATHIRI LEGHIYAM is clinically effective.
- Though there was appreciable clinical improvement, there were not much remarkable radiographic changes.

The action of external application of NAKKA PUSA MUKKUTTENNAI with varmam and asanam were given best results in patients than the patients were treated with internal medicine alone.

Treatment

The treatment was aimed to retain the deranged dhoshas and providing relief from symptoms. Before treatment the patients were advised to take Vellai ennai-15ml with hot water in early morning for first day of treatment.

From the second day onwards internal medcine KANDATHIRI LEGHIYAM 6 gms two times day after food and NAKKA PUSA mukuttuennai is given as external.

At the time of treatment the patients were advised to follow Pathiyam and specially advised to avoid foods which increase vadha.

Along with the course of treatment the complementary therapies like varmam and Asanam were given additionally to some of the patients.

The outcome of this study is mainly assessed by reduction in pain, swelling, stiffness in knee joint. Increased range of reduction of restricted movements and improvement in quality of life universal pain assessment scale was also used to detect proper outcome. No adverse effect was noted for both Internal and External medicine along with the course of treatment.

CONCLUSION

All 40 patients (20 OPD and 20 IP – 10 patients with trial medicines and Varmam, 10 with Asanam along with trial medicines) were treated for this dissertation work with KANDATHIRI LEGHIYAM 6gms two times a day and NAKKA PUSA MUKKUTTENNAI(externally)

In the pre clinical study pharmacological evaluation of the trial drug shows.

- Significant analgesic effect
- Significant Anti inflammatory effect (Internal medicine)

In the preclinical study toxicity study of "KANDATHIRI LEGHIYAM " shows that the trial drug had no acute toxicity.

The overall effect of the clinical trial drug are

Marked effect	-	60%
Moderate effect	-	17.5%
Mild effect	-	20%
No effect	-	2.5%

This result of the clinical trial illustrates the marked effect of the drugs and complementary therapy.

The trial drug KANDATHIRI LEGHIYAM and external NAKKA PUSA MUKKUTTENNAI is effective. No adverse effects were noticed during the treatment period. So the trial medicine is safe and easily preparable medicine.

INGREDIENTS OF KANDATHIRI LEGHIYAM (Internal)

CHUKKU

THIPPILI

ELAM

KIRAMBU

SEERAGAM

MULLANGI

PASUNEI

INJI CHARU

ELUMICHAI

PASUMPAL

NERUNJIL

MILAGU

PANAIVELLAM

KANDANGATHIRI

THALISAPATHIRI

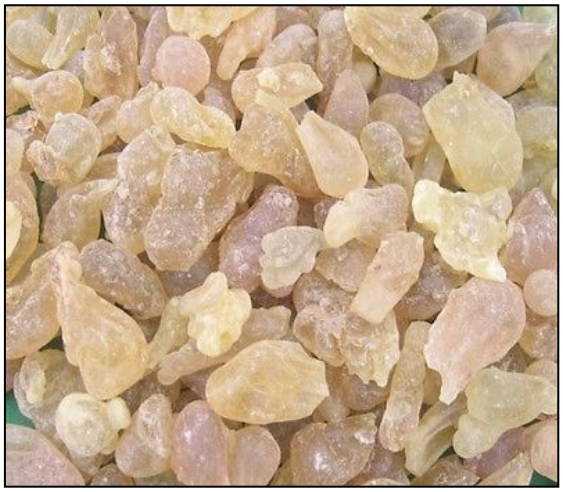
VAIVIDANGAM

INGREDIENTS OF MUKKUTTENNAI (External)

MANJAL

AMANAKKU ENNAI

THENGAI ENNAI



KUNTHIRIGAM

NALLAENNAI

KAADI NEER

ERUKKU

PULIELAI

NOCHI

KANDATHIRI LEGHIYAM (Internal)

NAKKA PUSA MUKKUTTENNAI (External)

ANNEXURE – I
PREPARATION AND PROPERTIES OF THE TRIAL DRUG

INTERNAL MEDICINE:
"KANDATHIRI LEGHIYAM "

(Ref: Agathiyar Vaithiya soothiram-650 Pg 161)

கண்டாத்திரி லேகியம்

மூழ்கவே கண்டாத்திரி லேகியம் சொல்வேன்
முக்கியமாம் இஞ்சிரசம் படிதானொன்று
நீழ்கவே கண்டங்கத்திரியின் கூட விட்டு
தாழ்கவே நெருஞ்சி நீர்ப் படிதான் ஒன்று
தப்பாமல் முள்ளங்கிப் படிநீர் விட்டு
வீழ்கவே பழச்சாறு படிதான் விட்டு
வியனான ஆவின் பால் படிஇரண்டே.

இரண்டான பனைவெல்லம் பலந்தான் எட்டு
நணுகியதை அடுப்பேற்றிப் பாகுதேறில்
குன்றான திரிகடுகு சீரகம் ஏலம்
குணமான வாய்விளங்கம் கிராம்பு தாளிசம்
நன்றாகப் பலமொன்று சூரணித்து
நலமுடனே நாற்படிதான் வலனும் சேரே.

வார்த்தப்பா கிண்டியதை மெழுகு போல
வளமான லேகியத்தைப் பதனம் பண்ணு
பார்த்தப்பா பாக்களவு வீதமாகப்
பதறாமல் இரு நேரம் கொள்ளும் காலம்
கார்த்தப்பா மண்டலந்தான் கொண்டாயானால்
போத்துறா நற்பித்தமொடு வாந்தி சூலை
புகழுநல் வழிவிலகும் பறந்து போகுமே.

போம்ப்பா அரோசிகங்கள் அன்ன தோஷம்
பொறுக்காத குன்மம் எட்டும் பொருமல் விக்கல்
சாமப்பா பித்தத்தின் எரிவு இதெல்லாம்
சாடிவிடும் கடுப்பு வலி சாந்தமாகும்
நாமப்பா பித்தத்தின் காபலக் குத்தல்
நாடாது மயக்கமெல்லாம் நடுங்கியோடும்
தேமப்பா குமரியிட தைல மூழ்கில்
திறமான தந்த நோய் தீரும் பாரே.

INGREDIENTS:

Sl.No	DRUGS	BOTANICAL NAME	QUANTITY
1	Ingi (Juice)	*Zingiber officinale*	1 Padi (1440 ml)
2	Kandangathri (Juice)	*Solanum surattense*	1 Padi (1440 ml)
3	Mullangi (Juice)	*Raphanus sativus*	1 Padi (1440 ml)
4	Neringil (Juice)	*Tribulus terrestris*	1 Padi (1440 ml)
5	Elumichai (Juice)\	*Citrus limon*	1 Padi (1440 ml)
6	Chukku	*Zingiber officinale*	1Palam (35 gm)
7	Milagu	*Piper Nigrum*	1Palam (35 gm)
8	Vaivilangan	*Embelia ribes*	1Palam (35 gm)
9	Seeragam	*Cuminum cyminum*	1Palam (35 gm)
10	Elam	*Elettaria cardamomum*	1Palam (35 gm)
11	Thippili	*Piper Longum*	1Palam (35 gm)
12	Kirambu	*Syzygium aromaticum*	1Palam (35 gm)
13	Thalisapaththiri	*Abies spectabilis*	1Palam (35 gm)
14	Cows milk		2 Padi (2880 ml)
15	Cows ghee		4 Padi (5760 ml)
16	Pannaivellam (Palm jaggery)		8 Palam (280 gm)

PURIFICATION:

All above drugs are purified under the formulation of "Anupoga Vaithiya Bramma Ragasiyam and Sarakku Suthi Muraigal"

Dose : Pakkalavu (6.022 grm)

Adjuvant : Milk

Duration : 48 days.

SOURCE OF RAW DRUGS:

The required raw drugs are purchased from authorized centers and standardized before preparing medicines. The raw drugs will be authenticated and then they are purified and the medicines are prepared in Gunapadam laboratory of Government Siddha Medical College, Palayamkottai.

PREPARATION:

Inji juice, Kandathiri juice, Mullangi juice, Neruchi juice and Lemon juice are taken in same ratio (1 Padi), and or mixed together along with this mixture cow's milk 2 padi also mixed.

After that 8 Palam palmjaggery is added to this mixture and placed in the stove and heat it. When paagu patham arrive add purified raw drugs pounded to powdered form. After that add 4 padi cow's ghee and mix well until mezhugu patham appear. Store in clean and air tight container.

DRUG STORAGE:

Leghiyam is stored in a clean and dry container and it is dispensed to the patient in packets.

1.இஞ்சி(Ingi)

வேறு பெயர்கள்:அல்லம் ஆர்த்தரகம் இலாக்கொட்டை நறுமறுப்பு மதில்

Botanical Name: Zingiber Officinale

Family: Zingiberaceae

Part used: Rhizome

சுவை: கார்ப்பு

தன்மை: வெப்பம்

பிரிவு: கார்ப்பு

செய்கை: வெப்பமுண்டாக்கி, பசித்தீத்தூண்டி, அகட்டுவாய்வகற்றி

Chemical Constituents: Phellandrene, Gingerol, Gingerine, Terpene, Tanin.

பொது குணம்:

இஞ்சிக் கிழங்குக் கிருமல்ஜயம் ஒக்காளம்

வஞ்சிக்குஞ் சன்னிசுரம் வன்பேதி- விஞ்சுகின்ற

சூலையறும் வாதம்போந் தூண்டாத தீபனமாம்

வேலையுறுங் கண்ணாய்-விளம்பு அ.கு

அழல்குற்றம்,முக்குற்றம் நீங்கும்.

2.கண்டங்கத்திரி(Kantankathiri)

Botanical Name: Solanum Surattense

Family: Solanaceae

Part used: Whole plant

சுவை: கார்ப்பு

தன்மை: வெப்பம்

பிரிவு: கார்ப்பு

செய்கை: கோழையகற்றி,சிறுநீர்பெருக்கி, அகட்டுவாய்வகற்றி

Chemical Constituents: Solonocarpine, Carpesterol, Solasomine, Solacarpidin.

பொது குணம்:

“காச சுவாசங் கதித்தஷய மந்தமனல்

வீசுசுரஞ் சன்னி விளைதோடம் - ஆசுறுங்கால்

இத்தரையு ணிற்கா எரிகாரஞ் சேர்க்கண்டங்

கத்தரியுண் டாமாகிற் காண்”.

- அகத்தியர் குணவாகடம்

காசம்,சுவாசம், ஷயம், அக்னிமந்தம், தீச்சுரம், சன்னிவாதம், ஏழுவகைத் தோடங்கள், வாதநோய் அகியவை போம்.

3.முள்ளங்கி (Mullangi)

வேறு பெயர்கள்:மூலபம்

Botanical Name: Raphanus sativus

Family: Brassicaceae

Part used: Rhizome

சுவை: கார்ப்பு

தன்மை: தட்பம்

பிரிவு: கார்ப்பு

செய்கை: வெப்பமுண்டாக்கி, பசித்தீத்தூண்டி, ஆண்மைபெருக்கி,மலமிளக்கி.

Chemical Constituents: Polysaccharides,Proteoglycan,Sulphur.

பொது குணம்:

வாதங் கரப்பான் வயிற்றெரிவு சூலைகுடல்

வாதங்கா சமையம் வன்தலைநோய் - மோதுநீர்க்

கோவைபன்னோய் பல்சிலந்தி குன்மமிரைப் புக்கடுப்புஞ்

சாவுமுள்ளங் கிக்கந்தத் தால். (அ.கு)

குணம்:

கரப்பான், தலைவலி, பல்சிலந்தி, வயிற்றெரிவு தீரும்.

4.நெருஞ்சில்(Nerunjil)

திரிகண்டம் கோகணடம் , கிட்டிரம்.

Botanical Name: Tribulus terrestris

Family: Zygophyllaceae

Part used: Whole plant

சுவை: துவர்ப்பு,இனிப்பு

தன்மை:சீதம்

பிரிவு: இனிப்பு

செய்கை: ஆண்மைபெருக்கி, துவர்ப்பி, உரமாக்கி, சிறுநீர்பெருக்கி, உள்ளழாற்றி

Chemical Constituents: Dioscin, Protodioscin, Diosgenin

பொது குணம்:

மேகவெட்டை நீர்ச்சுறுக்கு வீறுதிரி தோடம்புண்

வேகாசுர தாகவெப்பம் விட்டொழியும்-போகந்

தருஞ்சின மதலைமொழித் தையலே நல்ல

நெருஞ்சி லதனை நினை.

நீர்ச்சுறுக்கு, கல்லடைப்பு, முக்குற்றம், நீர்வேட்கை, முடவாயு தீரும்.

5.எலுமிச்சை(Elumichai)

Botanical Name: Citrus limon

Family: Rutaceae

Part used: Fruit

சுவை: புளிப்பு

தன்மை: வெப்பம்

பிரிவு: கார்ப்பு

செய்கை: குளிர்ச்சியுண்டாக்கி

Chemical Constituents: b-pinene,myrcene,a-terpene,limonene

பொது குணம்:

தீதெலு மிச்சங்காய் டேர்முத்தோ டத்தையுமுன்

வாதகப சூலையையும் மாகொடிய-சாதியெனுஞ்

சர்த்திகுன் மத்தையுமுன் தங்கமருந் திட்டதையும்

பித்தவெப்பை யுந்தணிக்கும் பேசு

முக்குற்றம் சூலை வாந்தி குன்மம் இடுமருந்து தீரும்.

6.மிளகு:(Milagu)

வேறு பெயர்கள்: கறி, காயம், கோளகம், சருமபந்தம், மாசம், மலையாளி, திரங்கம்.

Botanical Name: Piper nigrum

Family Name: Piperaceae

Part Used: Dried unripe fruit

சுவை: கைப்பு, கார்ப்பு.

தன்மை: வெப்பம்.

பிரிவு: கார்ப்பு.

Chemical constituents:Alkaloids-Piperine,piperidine,chavicin (Present in Masocarp), Dipiperamides D&E

செய்கை: வாதமடக்கி, வீக்கங்கரைச்சி.

கோணுகின்ற பக்கவலி குய்யவுரோ கம்வாத
சோணிதங்க ழுத்திற்குள் தோன்றுநோய்-காணரிய
காதுநோய் மாதர்குன்மம் காமாலை மந்தமென்றீர்
ஏதுநோய் காயிருக்கில் ஈங்கு.

-தேரையர் குணவாகடம்

7. சீரகம்(Seeragam)

வேறு பெயர்கள்: அசை, சீரி, உபகும்பீசம், நற்சீரி, துத்தசாம்பலம், பித்த நாசினி, போசன குடோரி, மேத்தியம்.

Botanical Name: Cuminum cyminum

Family Name: Apiaceae

Part Used: Seeds

சுவை: கார்ப்பு

தன்மை: தட்பம்

பிரிவு: இனிப்பு

செய்கை: அகட்டுவாய்வகற்றி,வெப்பமுண்டாக்கி,பசித்தீத்தூண்டி.

Chemical Constituents: Essential oil-thymene, cuminol, cumic aldehyde.

பொதுக்குணம் :

வாயுவொடு நாசிநோய் வன்பித்தஞ் சேராது

காயம் நெகிழாது கண்குளிருந் - தூயமலர்க்

காரளகப் பெண்மயிலே! கைகண்ட தித்தனையுஞ்

சீரகத்தை நீதினமுந் தின்

-அகத்தியர் குணவாகடம்

8. ஏலம்(Elam)

வேறு பெயர்கள்: ஆஞ்சி, கோரங்கம், துடி.

Botanical Name: Elettaria cardamomum.

Family Name: Zingiberaceae

Part used: Unriped Fruit

சுவை: கார்ப்பு

தன்மை: வெப்பம்

பிரிவு: கார்ப்பு

செய்கை: வெப்பமுண்டாக்கி, அகட்டுவாய்வகற்றி, சிறுநீர்ப்பெருக்கி.

Chemical constituents: Fixed oil, Essential oil, Volatile oil, Terpinyl acetate, Terpineol,Limonene.

பொதுக்குணம்:

தொண்டை வாய்கவுள் தாலுகு தங்களில்

தோன்றும் நோயதி சாரம் மேகத்தால்

உண்டை போல்எழுங் கட்டி கரிச்சரம்

உழலை வாந்தி சிலந்தி விஷஞ்சுரம்

பண்டை வெக்கை விதாகநோய் காசமும்

பாழுஞ் சோமப் பிணிவிந்து நட்டமும்

அண்டை யீளைவன் பித்தம் இவைக்கெல்லாம்

ஆல மாங்கமழ் ஏல மருந்தே.

9. கிராம்பு (Kirambu)

வேறுபெயர்கள்: அஞ்சுகம், உற்கடம் , கருவாய்க்கிராம்பு, சோசம், திரளி, வராங்கம்.

Botanical name: Syzygium aromaticum

Family name: Myrtaceae

Part used: Flower

சுவை: கார்ப்பு

தன்மை: வெப்பம்

பிரிவு: கார்ப்பு

செய்கை: இசிவகற்றி, அகட்டுவாய்வகற்றி, பசித்தீத்தூண்டி.

Chemical Constituents: Essential oil,B-caryophyllene,Eugenyl acetate,

பொதுக்குணம்:

பித்த மயக்கம் பேதியொடு வாந்தியும்போம்

சுத்தவிரத˙ தக்கடுப்புந் தோன்றுமோ-மெத்த

இலவங்கங் கொண்டவருக் கேற் சுகமாகும்

மலமங்கே கட்டுமென வாழ்த்து.

10. வாய்விடங்கம்(Vaividangam)

வேறுபெயர்கள்: கேரளம் , வர்ணனை.

Botanical name: Emblica ribes

Family name: Primulaceae

Part used: Seeds

சுவை: கைப்பு

தன்மை: வெப்பம்

பிரிவு: கார்ப்பு

செய்கை: புழுக்கொல்லி, அகட்டுவாய்வகற்றி, வெப்பமுண்டாக்கி.

Chemical constituents: Emblic acid, Tanin, Alkaloids-Cristembine,Vidangin,Emblin.

பொதுக்குணம்:

பாண்டுகுட்டம் குன்மம் பருந்தூல நோய்வாதந்

தீண்டு திரிவிடந் சிரந்துண்டம்-பூண்டமடி

நோய்விளங்கக் காட்டாத நுண்கிருமி யாசனப்புண்

வாய்விளங்கங்காட்டவிருமார்.

11.தாளிசபத்திரி(Thalisapathiri)

Botanical name:Abies spectabilis

Family name:Pinaceae

Part used: Leaf

சுவை: கார்ப்பு

தன்மை: வெப்பம

பிரிவு: கார்ப்பு

செய்கை: பசித்தீத்தூண்டி, அகட்டுவாய்வகற்றி, கோழையகற்றி, உரமாக்கி.

பொதுக்குணம்: நாசி களப்பிணிகள் நாட்பட்ட -காசஞ்சு

வாசம் அருசி வனமங்கால் -வீசிவரு

மேகமந்தம் அத்திசுரம் விட்டேகுந் தாளிச்சத்தால்

ஆகுஞ் சுகப்பிரச வம்.

தீரும் நோய்கள்: கழிச்சல் , சுரம் , நாட்பட்ட இருமல் , இரைப்பு, வாந்தி, வாய்வு, அசீரணம் , அத்திசுரம் தீரும். இதனால் சுகப்பிரசவம் உண்டாகும்.

12.சுக்கு(Chukku)

அருக்கன், உபகுல்லம், உலர்ந்தஇஞ்சி, சுண்டி, நவசுறு, நாகரம், விடமூடிய அமிர்தம், வேர்கொம்பு.

Botanical Name: Zingiber Officinale

Family: Zingiberaceae

Part used: Dried rhizome

சுவை: கார்ப்பு

தன்மை: வெப்பம்

பிரிவு: கார்ப்பு

செய்கை: வெப்பமுண்டாக்கி, பசித்தீத்தூண்டி, அகட்டுவாய்வகற்றி

Chemical Constituents: Phellandrene, Gingerol, Gingerine, Terpene, Tanin.

பொது குணம்:

செரியாமை, மார்பெரிச்சல், புளியேப்பம், வெப்பம், கீழ்வாய் நோய், இரைப்பு, இருமல், கழிச்சல், நீரேற்றம், குன்மம், வயிற்றுப்பிசம், காதுகுத்தல்,முகநோய், தலைநோய், குலைவலி, பாண்டு, வயிற்றுக் குத்தல், ஐயசுரம் போம்.

“சூலைமந்தம் நெஞ்செரிப்பு தோடமேப் பம்மழலை

மூலம் இரைப்பிருமல் மூக்குநீர் - வாலகப

தோடமதி சாரந் தொடர்வாத குன்மநீர்

தோடம்ஆ மம்போக்குஞ் சுக்கு”.

- அகத்தியர் குணவாகடம்

“வாதப் பிணிவயி றுதழ் செவிவாய்

வலிதலை வலிகுலை வலியிரு விழிநீர்

சீதத் தொருவரி பேதிப் பலரோ

சிகமலி முகமக முகமிடி கபமார்

சீத சுரம்விரி பேதச் சுரநோய்

தெறிபடுமெனமொழி குவர்புவி தனிலே

ஈதுக் குதவுமி தீதுக குதவா

தெனும்விதி யிலைநவ சுறுகுண முனவே”

- தேரையர் குணவாகடம்

13. திப்பிலி(Thippli)

வேறுபெயர்

ஆர்கதி, உண்சரம், உலவைநாசி, காமன், குடோரி, கோழையறுக்கி, பிப்பிலி, ஆதிமருந்து

Botanical name - piper longum

Family - Piperaceae

Part used - fruit

சுவை : இனிப்பு

தன்மை : தட்பம்

பிரிவு : இனிப்பு

Constituents

Piperine, rutin beto - carpophylleneliperline, piperamine, lialool

செய்கை

வெப்பமுண்டாக்கி

அகட்டுவாய்வகற்றி

பொதுகுணம் :

‘கட்டியெதிர்நின்றுகடுநோயெல்லாம் பணியும்
திட்டிவினையகலும் தேகமெத்த - புட்டியாம்
மாமனுக்குமாமமெனமற்றவர்க்குமற்றவனாங்
காமமெனுந் திப்பிலிக்கும் கை’’ -தேரன்வெண்பா

15. நெய்:

English Name:Ghee

பொதுக்குணம்:.

தாகமுழ லைகட்கம் வாந்தி பித்தம் வாயுபிர
மேகம் வயிற்றெரிவு விக்கலழல்-மாகாசங்
குன்மம் வறட்சி குடற்புரட்ட லஸ்திகட்கஞ்
சொன்மூலம் போக்கநிறைத் துப்பு.

16.பனை வெல்லம்

பொது குணம்:

.....தங்குபனை
வெல்லத்தால் வாதபித்தஞ் வீறுகபஞ் சன்னிநோய்
வல்லருசி குன்மமறு மால்.

தீரும் நோய்கள்:

முக்குற்றம் முப்பிணி குன்மம் சுவையின்மை நீங்கும்

17. பசும்பால்

வேறுபெயர் : பயசு, சுதை, துத்தம், கீரம், பயம், அமுது

பொதுகுணம்:

பாலர் கிழவர் பழஞ்சுரத்தோர் புண்ணாளி
சூலையர் துர்ப்பலத்தோர் மேகநோயாளி ஏலுமிவர்
எல்லார்க்கு மாகும் இளைத்தவர்க்குஞ் சாதகமாய்
நல்லாய் பசுவின்பால் நாட்டு

பொருள் : பாலர் முதல் கிழவர் வரை ஆகும் சூலை, மேக நோய் நீங்கும்.

EXTERNAL MEDICINE:

"NAKKA PUSA MUKKUTTENNAI"

(Ref: Yugimuni vaithiya kaviyam Pg 37)

நக்க பூச முக்கூட்டெண்ணெய்
ஆமேயிதற்குநல்லெண்ணெய் யாமணக்கெண்ணெய்தேங்காய் நெய்
போமேநொச்சியெருக்கிலையும் புளியின்சாரொன்றொருநாழி
நாமேசொன்னோம்குந்தரிக்கம் நல்லமஞ்சளிவையொக்க
பூமேயோரொன்றைங்கழஞ்சு பிளித்தகாடிநாழியிடே

இட்டேயரைத்துயிவைகலந்து யேகக்குழைப்பியெரித்திறக்க
தொட்டேபணவிடைதானக்கி துவாலையிடவும் வல்லீராய்
மூட்டுவாதமுடங்கல்வலி முதிர்ந்தபலபலவாதமெலாங்
நெட்டேன்கெட்டேனெனெனெப்போகுங்கேட்குமுலகோரக்கிதுமருந்தே.

Ingredients

Sl. No	DRUGS	BOTANICAL NAME	QUANTITY
1	Notchi elai	Vitex negundo	1 Nazhi (1.34 lr)
2	Erruku elai	Calotropis Gigantea	1 Nazhi (1.34 lr)
3	Puli Elai	Tamaringus indica	1 Nazhi (1.34 lr)
4	Kunthirikkam	Boswellia serrata	5 Kazhanju (25.5grm)
5	Manjal	Curcuma longa	5 Kazhanju (25.5grm)
6	Gingely oil	Sesamum indicum	1 Nazhi (1.34 lr)
7	Coconut oil	Cocos nucifera	1 Nazhi (1.34 lr)
8	Gaster oil	Ricinus communis	1 Nazhi (1.34 lr)
9	Pulitha kaadi (Vinigar)		

PURIFICATION:

All above drugs are purified under the formulation of "Anupogu Vaithiya Bramma Ragasiyam and Sarakku Suthi Muraigal"

METHOD OF PREPARATION :

Gingely oil, castor oil, coconut oil, Nochi juice, erukku elai Juice, Pulielai juice, all same radio 1 Nazhi. Kunthirikam, Manjal 5 Kazhanju, Pulitha kaadi 1 Nazhi, Mix all above juices and kaadi and heat and drain it.

INDICATIONS:

It is indicated externally for Joint Pain.

1. எருக்கு

Botanical Name : Calotropis Gigantea

Family : Asclepiadaceae

Part Used : Leaf

சுவை : கார்ப்பு

வீரியம் : வெப்பம்

பிரிவு : கார்ப்பு

Therapeutic Actions : Anti inflammatory, Analgesic

Chemical Constituents : Caoutchouc, Asclepin, Gigastin, Mudarine.

பொதுகுணம்:

எலிவிடங் குட்டமைய மேறு கிருமி
வலிசூலை வாயுவிட மந்தம்-மலபந்தம்
எல்லா மகலு மெருக்கிலை யைக்கண்டால்
வில்லார் நுதலே! விளம்பு.

- அகத்தியர் குணவாகடம்

பொருள்: எருக்கிலையினால் கீல் வீக்கம், வளி இவை போம்.

2. நொச்சி

Botanical Name : Vitex Negundo

Family : Verbenaceae

வேறு பெயர் : இந்திரசூரியம், நிர்க்குண்டி, சிந்தும சிந்துவாரம்

Part Used : Leaf

சுவை : கைப்பு, கார்ப்பு

வீரியம் : வெப்பம்

பிரிவு : கார்ப்பு

Therapeutic Actions : Alterative, Vermituge, Antivatha activity

பொதுகுணம்:

...கரநொச்சிற் பட்டையது
தள்ளு சன்னி வாதமகற்றும்...

- அகத்தியர் குணவாகடம்

பொருள்: நொச்சியினால் முப்பிணியும், வளி நோயும் நீங்கும்.

3. புளி இலை

Botanical Name : Tamarindus Indica

Family : Caesalpiniaceae

வேறு பெயர் : சிந்தூரம், சிந்தகம், ஆம்பிரம்

Part Used : Leaf

சுவை : புளிப்பு

வீரியம் : வெப்பம்

பிரிவு : கார்ப்பு

Therapeutic Actions : Refrigerant, Antibilios, Stimulant, Laxative, Antivatha activity

Chemical Constituents : Tartaric acid

பொதுகுணம்:

அழுபுண்ணை நீக்கும் அடல்சோபை மாற்றும்
எழுபாண்டு வைப்போக்கும் இப்பால் - முழுதும்
அளியச் சிவந்தகண்ணோ யாற்றுங் கனலாம்
புளியிலையை நன்றாய்ப் புகல்.

- அகத்தியர் குணவாகடம்

4. குந்தரிக்கம்

Botanical Name : Boswellia Serrata

Family : Burseraceae

வேறு பெயர் : குமைஞ்சான், நறும்பிசின், பறங்க்ச்சாம்பிராணி

Part Used : Gum Resin

சுவை : கைப்பு

வீரியம் : வெப்பம்

பிரிவு : கார்ப்பு

Therapeutic Actions : Stomachic, Diaphoretic, Astrigent, Refrigerant, Diuretic, Emmenagogue, Expectorant

பொதுகுணம்: குந்திரிக்கம் ‘‘நரம்பு சம்பந்தமாக நோய்களுக்கும், வாத நோய்களுக்கும்’’ சிறந்த மருந்தாகும்.

5. மஞ்சள்

Botanical Name	:	Curcuma Longa
Family	:	Zingiberaceae
வேறு பெயர்	:	அரிசனம், பீதம், நிசி
Part Used	:	Rhizome
சுவை	:	கைப்பு
வீரியம்	:	வெப்பம்
பிரிவு	:	கார்ப்பு
Therapeutic Actions	:	Carminative, Stimulant, Hepatic tonic
Chemical Constituents	:	Curcumin, Curcuminoid, Demethoxycurcumin, Zingiberene

பொதுகுணம்:

பொன்னிறமாம் மேனி புலானாற்ற மும்போகும்
மன்னு புருட வசியமாம்-பின்னியெழும்
வாந்திபித்த தோடமையம் வாதம்போந் தீபனமாங்
கூர்ந்தமஞ்ச ளின் கிழங்குக்கு

- அகத்தியர் குணவாகடம்

பொருள் : வளி, தீ, ஐயக்குற்றம் இவை நீங்கும்.

6. தேங்காய் எண்ணெய்

உயர்ந்த அழுத்தத்தின் மூலம் 'கொப்பரை' எனப்படும் தேங்காயிலிருந்து ''தேங்காய் எண்ணெய்'' எடுக்கப்படுகிறது.

Botanical Name	:	Cocos Nucifera
Family	:	Arecaceae
வேறு பெயர்	:	பூலோக கற்பகவிருட்சம், நாளிகேரம், இலாங்கலி, தாழை
Part Used	:	Seed
சுவை	:	இனிப்பு
வீரியம்	:	தட்பம்
பிரிவு	:	இனிப்பு
Therapeutic Actions	:	Nutrient Antiulcer, Antiinflammatory, than used for hair growth,
Chemical Constituents	:	Lawric acid, Myristic acid

7. நல்லெண்ணெய் (எள்)

(எள்ளில் இருந்து நல்லெண்ணெய் தயாரிக்கப்படுகிறது)

Botanical Name : Sesamum Indicum

Family : Pedaliaceae

Part Used : Seed

சுவை : இனிப்பு

தன்மை : வெப்பம்

பிரிவு : இனிப்பு

Therapeutic Actions : Emmlnagogie, Stimulant, Tonic, Diuretic, Galactogogce.

Chemical Constituents : Vitamin E, Sesamin, Segamolin, Phytosterol.

பொதுகுணம்:

கண்ணுக்கு ஒளியையும் உடலுக்கு வன்மையும் தரும்
குருதி பெருக்கை உண்டாகும்
- அகத்தியர் குணவாகடம்

8. ஆமணக்கு எண்ணெய் (விளக்கெண்ணெய்)

Botanical Name : Ricinus Communis

Family : Euphorbiaceae.

வேறு பெயர் : ஏரண்டம், சித்திரம், தலரூபம்

Part Used : Seed

சுவை : கசப்பு

வீரியம் : வெப்பம்

பிரிவு : கார்ப்பு

Therapeutic Actions : Laxative, Emollient

Chemical Constituents : Ricinine, Ricin, Resin

பொதுகுணம்:

ஆமணக் கெண்ணெய் தன்னை யணிநில மறிய கேண்மின்
பூமணச் சந்துதோறும் பொருந்திய வாதம் போக்கும்
தீமந்தத் தானும் போக்குந் திகழ்வுடன் விரைவு முண்டாம்
தீமனக் குடலில் வாதஞ் சேர்குட லேற்றம் போமே
- எடு

பொருள் : ஆமணக்கெண்ணெயினால் வாதம் நீங்கும்.

9. Tamilname; காடிநீர்

Common name : rice vinegar

Uses :

As a antiseptic.

ANNEXURES -II

QUALITATIVE AND QUANTITATIVE ANALYSIS

BIO-CHEMICAL ANALYSIS OF KANDATHIRI LEGHIYAM (IN POWDER FORM)

Preparation of the extract:

5gms of the drug was weighed accurately and placed in a 250ml clean beaker. Then 50ml of distilled water is added and dissolved well. Then it is boiled well for about 10 minutes. It is cooled and filtered in a 100ml volumetric flask and then it is made to 100ml with distilled water. This fluid is taken for analysis.

QUALITATIVE ANALYSIS

S.NO	EXPERIMENT	OBSERVATION	INFERENCE
1.	**TEST FOR CALCIUM** 2ml of the above prepared extract is taken in a clean test tube. To this add 2ml of 4% Ammonium oxalate solution.	A white precipitate is formed.	**Indicates the presence of calcium.**
2.	**TEST FOR SULPHATE** 2ml of the extract is added to 5% Barium chloride solution.	No white precipitate is formed.	Absence of sulphate.
3.	**TEST FOR CHLORIDE** The extract is treated with silver nitrate solution.	A white precipitate is formed.	**Indicates the presence of chloride.**
4.	**TEST FOR CARBONATE** The substance is treated with concentrated HCL.	No Brisk effervescence is formed	Absence of carbonate
5.	**TEST FOR STARCH** The extract is added with weak iodine solution.	Blue colour is formed.	**Indicates the presence of starch**.

6.	**TEST FOR FERRIC IRON** The extract is acidified with Glacial acetic acid and potassium ferro cyanide.	No blue colour is formed.	Absence of ferric iron.
7.	**TEST OF FERROUS IRON** The extract is treated with concentrated Nitric acid and Ammonium thio cyanide solution.	Blood red colour is formed.	**Indicates the presence of ferrous iron.**
8.	**TEST FOR PHOSPHATE** The extract is treated with Ammonium Molybdate and concentrated nitric acid.	No yellow precipitate is formed.	Absence of phosphate.
9.	**TEST FOR ALBUMIN** The extract is treated with Esbach's reagent.	No Yellow precipitate is formed.	Absence of Albumin.
10.	**TEST FOR TANNIC ACID** The extract is treated with ferric chloride.	No Blue black precipitate is formed.	Absence of tannic acid.
11.	**TEST FOR UNSATURATION** Potassium permanganate solution is added to the extract.	It gets decolourised.	**Indicates the presence of unsaturated compound.**
12.	**TEST FOR THE REDUCING SUGAR** 5ml of Benedict's qualitative solution is taken in a test tube and allowed to boil for 2 mts and add 8-10 drops of the extract and again boil it for 2	Colour change occurs.	**Indicates the presence of Reducing sugar.**

	minutes.		
13.	**TEST FOR AMINO ACID** One or two drops of the extract is placed on a filter paper and dried well. After drying, 1% Ninhydrin is sprayed over the same and dried it well.	Violet colour is formed.	**Indicates the presence of Amino acid.**
14.	**TEST FOR ZINC** The extract is treated with Potassium Ferrocyanide.	No white precipitate is formed	Absence of Zinc.

Inference:

The given sample of "KANDATHIRI LEGHIYAM " contains Calcium, Chloride, Starch. Ferrous iron, Unsaturated compound, Reducing sugar and Amino acid.

ANNEXURE – III
PHARMACOLOGICAL ANALYSIS

EFFECT OF KANDATHIRI LEGHIYAM ON CARRAGEENAN-INDUCED LOCALISED INFLAMMATORY PAIN IN RATS

The study plan was developed based on the guidelines of Vogel[1] and also it has reference to Chao Ma and Jun-Ming Zhang[2] and Walker et al. [3,] Winter CA, Risley EA, Nuss GW. Carrageenin induced edema in hind paw of the rat as an assay for anti-inflammatory drugs. Proc Soc Exp Biol Med. 1962; 111:544–7

The animals were housed in polypropylene cages with stainless steel top grills having facilities for holding pellet food and drinking water in bottle with stainless steel sipper tube. Each cage contained 6 rats. All rats had free access to potable water and standard pelleted laboratory animal diet *ad libitum*. Paddy husk was used as bedding material. The animals were divided into 5 groups (6 rats/group). Localized inflammatory pain was induced in all groups of animals by intraplantar injection of carrageenan (50 µl of 3% suspension). Group 1 received vehicle orally, Group 2 received a standard anti-analgesic drug, Diclofenac sodium (10 mg/kg i.p), whereas groups 3, 4 and 5 received KANDATHIRI LEGHIYAM 3.024mg, 15.12mg and 75.6mg b.w. The doses of KANDATHIRI LEGHIYAM were prepared in Honey, where as Diclofenac sodium was dissolved in normal saline.

One day before the experiment, three basal readings of hind paw in each rat were recorded. **Group I** received (0.1ml of 1% carragennan) , **Group II** animals received Diclofenac sodium (20 mg/kg po). **Group-III, IV** and **V** animals received the KANDATHIRI LEGHIYAM 3.024mg, 15.12mg and 75.6mg b.w. After 30 min, the rats were challenged with subcutaneous injection of 0.1 ml of 1% w/v solution of carrageenan into the sub plantar region of left paw. The paw was marked with ink at the level of lateral malleolus and immersed in mercury up to the mark. The paw volume was measured at 0, 1, 2,

3, 4, 5 and 6th hr after carrageenin injection using Digital Plethysmometer. The difference between initial and subsequent reading gave the actual edema volume.

INTRODUCTION

Intraplantar injection of carrageenan into the hind paw produces localized inflammation in rats (Urban et al., 2000). An intraplantar injection of carrageenan is widely used to produce a model of localized inflammatory pain.

OBJECTIVE

To study the anti-inflammatory effect of KANDATHIRI LEGHIYAM in the rat model of Carrageenan-induced localized inflammation.

1.1.1 Study Guidelines

This study plan has reference to Vogel (2002), Chao Ma and Jun-Ming Zhang (2011) and Walker et al. (2003).

1.1.2 MATERIALS AND METHODS

1.1.3 Test System

Species : Rat

Strain : Wistar

Age : 6-8 weeks at the time of dosing

Total no. of Rats: 30

Sex : Male

EXPERIMENTAL DESIGN:

Group-I: Served as a negative control (0.1ml of 1% carrageenin)

Group-II: Served as standard received Diclofenac sodium (20mg/kg,.po) +

(0.1ml of 1% carrageenin)

Group-III: Received KANDATHIRI LEGHIYAM (3.024mg/kg) +

(0.1ml of 1% carrageenin)

Group IV: Received KANDATHIRI LEGHIYAM (15.12mg/kg) +

(0.1ml of 1% carrageenin)

Group IV: Received KANDATHIRI LEGHIYAM (75.6mg/kg) +

(0.1ml of 1% carrageenin)

Administration Procedure

Inflammatory pain was induced in animals belonging to all the Groups by injection of Carrageenan (50 µl of 3% suspension) into the intrplantar region of the right hind paw using a 27-gauge needle attached to a Hamilton syringe under mild ether anaesthesia. The test item KANDATHIRI LEGHIYAM and reference drug in Diclofenac sodium were administered orally with carrageenan injection to the respective groups. Prior to the above administrations, food alone was withdrawn from all the groups overnight (water was provided *ad libitum*).

Parameters Assessed

Paw volume was measured post treatment at 0, 1, 2, 3, 4, 5 and 6^{th} hr after carrageenin injection using Digital Plethysmometer.

DOSAGE SCHEDULE:

The required dose for mice/rat will be calculated by using the standard dose calculation procedure from recommended clinical dose.

CONVERSION FORMULA:

Human dose is 6g day

Total clinical dose (a) x conversion factor (b) 0.018 = (c) per 30 gm of mice

1000 mg x 2(a) x 0.018 (b) = 18 (c) /140gms of mice

108/1000x140 = 15.12 mg

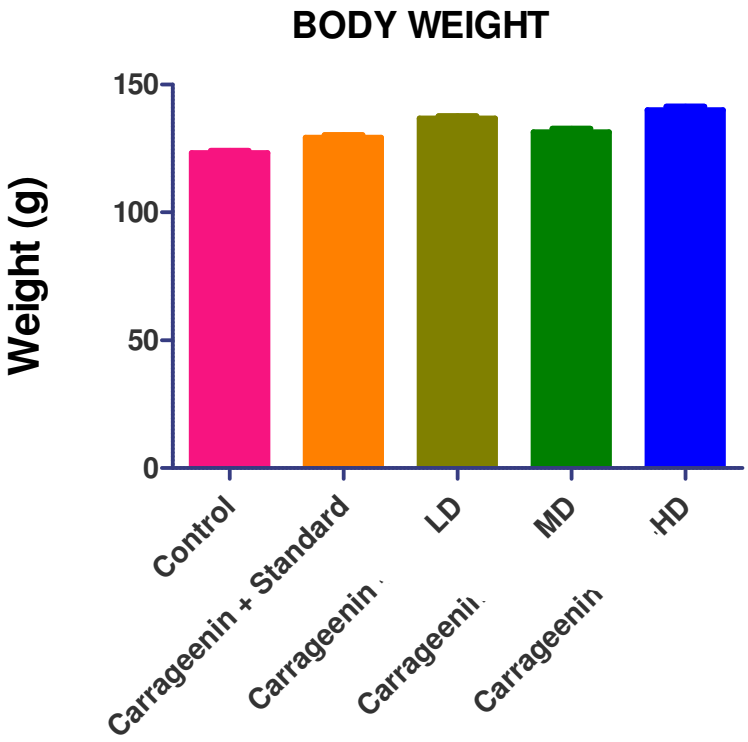
Experimental Doses Calculated as per the standard procedures are

S.No	Groups	Dose /kg, weight	Dose /30 gms. weight	Volume of administration
1	Vehicle Control	--	--	1 ml
2	Therapeutic Dose	15.12 mg	3.024mg	1 ml
3	Middle Dose	75.6mg	15.12mg	1 ml
4	High Dose	378mg	75.6mg	1 ml

1.1.4 TABLE: EFFECT OF KANDATHIRI LEGHIYAM ON CARRAGEENIN-INDUCED PAW EDEMA IN RATS (BODY WEIGHT)

Group	Only Carrageenin	Carrageenin + Standard	Carrageenin+ KL-LD	Carrageenin + KL MD	Carrageenin + KL- HD
INITIAL BODY WEIGHT	123.167±0.909823	129.167±1.04616	136.833±0.833333	131.333±1.33333	140±1.39044

Values are expressed as the mean ± S.D. Statistical significance (p) calculated by one way ANOVA followed by dunnett's. ns- not significant $^{**}P< 0.05$ calculated by comparing treated group with control group


BODY WEIGHT
Weight (g)
150
100
50
0
Control
Carrageenin + Standard
LD
MD
HD

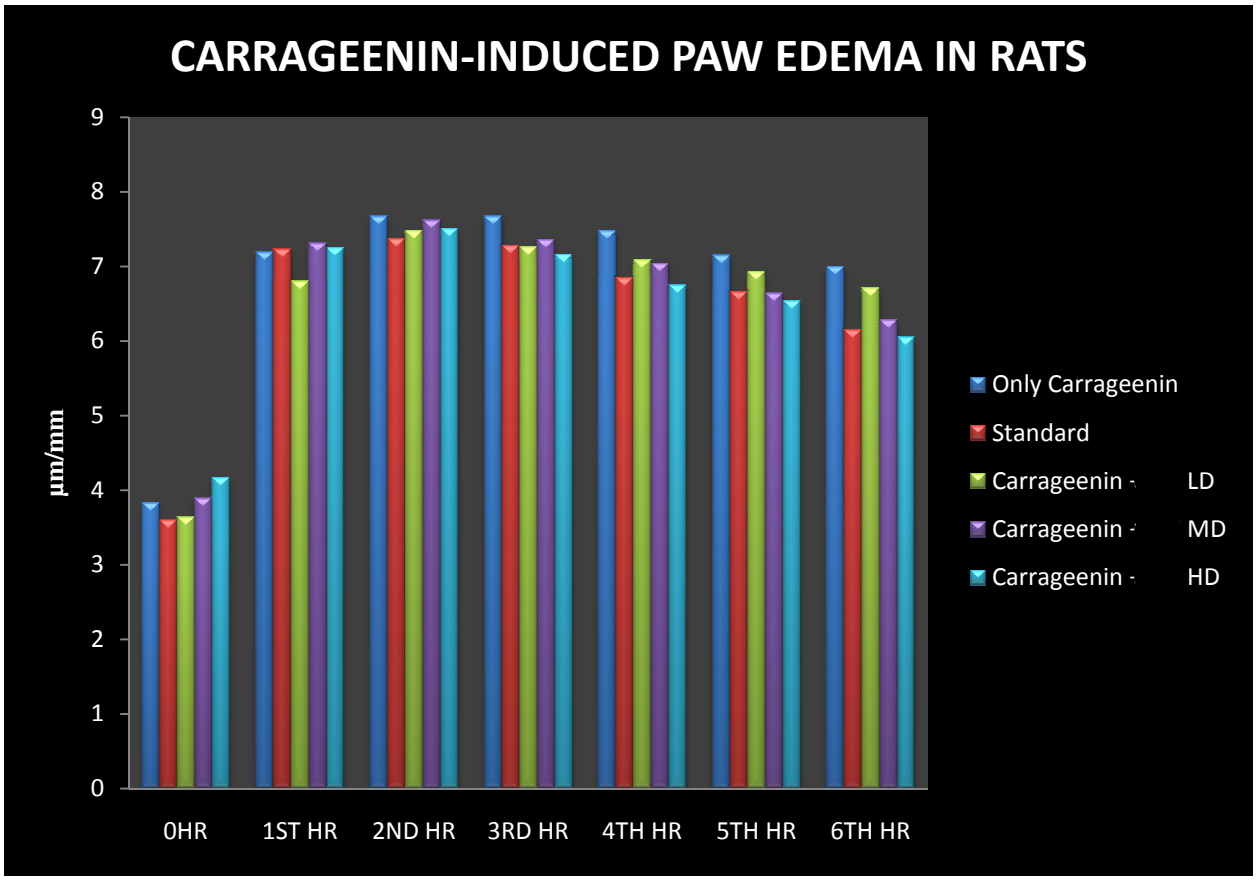
1.1.5 TABLE: EFFECT OF KANDATHIRI LEGHIYAM ON CARRAGEENIN-INDUCED PAW EDEMA IN RATS

Group	Mean paw volume before carrageenan injection	Paw Volume after induction with carrageenin Increase in paw volume (Mm) after carrageenan injection (mean ± SEM)/Percent inhibition of edema					
	0 min	1h	2h	3h	4h	5h	6h
Only carrageenan	3.83± 0.189367	7.19667± 0.131901	7.67667± 0.148272	7.67167± 0.0617747	7.485± 0.067614	7.15333± 0.0832133	7.00833± 0.0838418
carrageenan + Standard	3.60833± 0.125391	7.23± 0.152818	7.37± 0.127828	7.28833± 0.0352531*	6.85167± 0.141243**	6.665± 0.142144*	6.15167± 0.162448***
carrageenan + KL LD	3.64± 0.116304	6.80333± 0.0956963	7.48167± 0.100745	7.26667± 0.0644291*	7.09167± 0.050492^{ns}	6.93667± 0.0614094^{ns}	6.71333± 0.052578^{ns}
carrageenan + KL MD	3.89667± 0.169188	7.31667± 0.10388	7.62167± 0.142978	7.365± 0.138124^{ns}	7.04333± 0.124971*	6.645± 0.111228**	6.285± 0.126221**
carrageenan + KL HD	4.17333± 0.166907	7.25167± 0.104384	7.51667± 0.124944	7.16833± 0.104385**	6.75167± 0.163022***	6.54667± 0.120766**	6.05± 0.180924***

Values are expressed as the mean ± S.D. Statistical significance (p) calculated by one way ANOVA followed by dunnett's. ns- not significant $^{**}P< 0.05$ calculated by comparing treated group with control group.

1.1.6 TABLE: EFFECT OF KANDATHIRI LEGHIYAM ON CARRAGEENIN-INDUCED PAW EDEMA IN RATS

Group	Paw Volume after induction with carrageenin Increase in paw volume (Mm) after carrageenan injection (mean ± SEM)/Percent inhibition of edema			
	Initial Paw volume(mm)	**Final Paw volume(mm)**	**Difference**	**Percentage protection (%)**
Control	3.88± 0.19836	3.88± 0.19836	--------	------
Only carrageenan	3.83± 0.189367	7.00833± 0.0838418	3.17	82.76 %
carrageenan + Standard	3.60833± 0.125391	6.15167± 0.162448***	2.55	70.83 %
carrageenan + KL LD	3.64± 0.116304	6.71333± 0.052578^{ns}	3.07	84.34 %
carrageenan + KL MD	3.89667± 0.169188	6.285± 0.126221**	2.39	61.43 %
carrageenan + KL HD	4.17333± 0.166907	6.05± 0.180924***	1.88	45.08 %

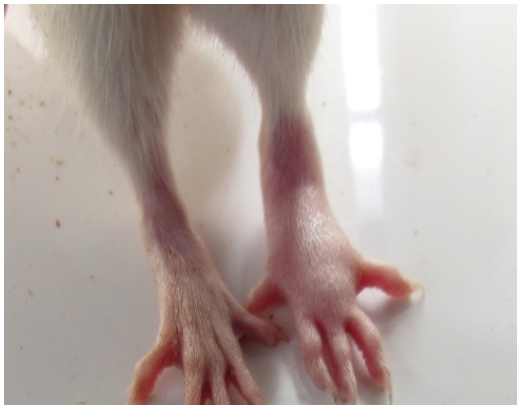


1.1.7 FIG: EFFECT OF KANDATHIRI LEGHIYAM CARRAGEEN IN-INDUCED PAW EDEMA IN RATS

1.1.8 EFFECT OF KANDATHIRI LEGHIYAM ON CARRAGEENIN-INDUCED PAW EDEMA IN RATS

GROUP – I-CONTROL

GROUP – II ONLY CARRAGEENIN



GROUP – III- CARRAGEENIN+ STD

GROUP –IV- CARRAGEENIN+ L.D

GROUP – V- CARRAGEENIN+ M.D

GROUP – VI- CARRAGEENIN+ H.D

1.1.9 CONCLUSION

To conclude, the **KANDATHIRI LEGHIYAM** were evidenced as a siddha drug for the treatment of pain and inflammation and it is found that it useful for inflammatory disorders.

EFFECT OF KANDATHIRI LEGHIYAM WITH HONEY/GHEE ON ACETIC ACID INDUCED WRITHING IN MICE[1]

1. Kaneria MS, Naik SR, Kohli RK. Anti-inflammatory,antiarthritic and analgesic activity of a herbal formulation. Indian J.Experimental Biol. 2007; 45: 279.

Acetic acid induced writhing method was adopted for evaluation of analgesic activity. Writhing is defined as a stretch, tension to one side, extension of hind legs, contraction of the abdomen so that the abdomen of mice touches the floor, turning of trunk (twist). Any writhing is considered as a positive response.

MATERIAL AND METHODS

ANIMALS:

Healthy Swiss albino rats of either sex weighing 20-25g were used in this study. All the animals were obtained from Animal house of the KMCH College of Pharmacy, Coimbatore. The animals were housed comfortably in a group of six in a single clean plastic cage with a metal frame lid on its top. They were housed under standard environmental conditions of temperature (24±1°C) and relative humidity of 30-70 %. A 12:12 h light dark cycle was followed. All animals had free access to water and standard pelletized laboratory animal diet ad libitum. All the experimental procedures and protocols used in this study were reviewed and approved via the Approval No. ---------- by the Institutional Animal Ethical Committee (IAEC) of KMCH College of Pharmacy, Coimbatore (685/PO/Re/S/2002/CPSCEA Dated 21st August 2002 constituted in accordance with the guidelines of the CPCSEA, Government of India.

DRUGS:

Acetic acid (Sigma Chemical Co. Bangalore, India) and Indomethacin were purchased from (Ranbaxy, India). All drugs were dissolved in saline. The different doses of **KANDATHIRI LEGHIYAM** were prepared **WITH HONEY/GHEE**.The control group received vehicle as control. All drugs were prepared just before use.

PREPARATION OF ACETIC ACID:

A solution of acetic acid (1% v/v) in distilled water was prepared.

DOSAGE SCHEDULE:

The required dose for mice/rat will be calculated by using the standard dose calculation procedure from recommended clinical dose.

CONVERSION FORMULA:

Human dose is 6000 mg /kg day

Total clinical dose (a) x conversion factor (b) 0.018 = (c) per 30 gm of mice

6000 mg x 2(a) x 0.018 (b) = 108 (c) /30 gm of mice

108/1000x30 = 3.24 mg

Experimental Doses Calculated as per the standard procedures are

S.No	Groups	Dose /kg, weight	Volume of administration
1	Vehicle Control	--	0.5 ml
2	Therapeutic Dose	3.24 mg /kg	0.5 ml
3	Middle Dose	16.2mg/kg	0.5 ml
4	High Dose	81mg/kg	0.5 ml

EXPERIMENTAL PROCEUDRE:

GROUP 1 – CONTROL (IP injection of 0.1 ml 1% acetic acid)

GROUP 2 -- IP injection of 0.1 ml 1% acetic acid + Indomethacin (5mg/kg, i.p)

GROUP 3 -- 0.1 ml 1% acetic acid (ip) + KANDATHIRI LEGHIYAM WITH HONEY/GHEE **3.24MG /KG(PO)**

GROUP 4 -- 0.1 ml 1% acetic acid (ip) + KANDATHIRI LEGHIYAM WITH HONEY/GHEE **16.2mg/Kg(Po)**

GROUP 5 -- 0.1 ml 1% acetic acid (ip) + KANDATHIRI LEGHIYAM WITH HONEY/GHEE **81mg/kg(po)**

PROCEDURE:

Wister albino mice of either sex were divided into five different groups each containing Six animals, the animals were marked individually. Food was withdrawn 12 hours prior to drug administration till completion of experiment. The animals were weighed and numbered appropriately. The test and standard drugs were given orally. After 60 minutes writhing was induced by intra-peritoneal injection of 1% acetic acid in volume of 0.1 ml/10g body weight. The writhing episodes were recorded for 30 minutes; stretching movements consisting of arching of the back, elongation of body and extension of hind limbs were counted. Anti-nociceptive activity was expressed as the percentage inhibition of abdominal constrictions using the ratio:

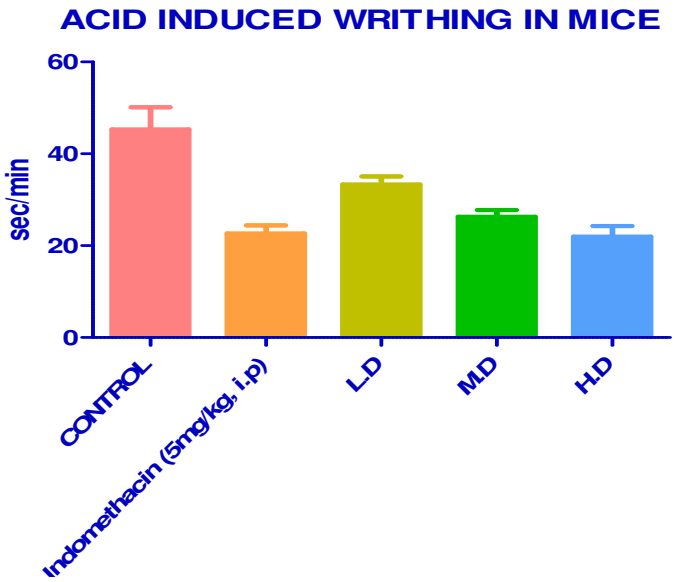
(Control mean – Treated mean) × 100/Control mean

GROUP	No of Writhing (30min)	Inhibition (%)
CONTROL	45.33±4.807	---
Indomethacin (5mg/kg, i.p)	22.67±1.764***	49.98 %
KANDATHIRI LEGHIYAM **0.028mg/kg(po)**	33.33±1.764*	26.47 %
KANDATHIRI LEGHIYAM **0.014mg/kg(po)**	26.33±1.453**	41.91 %
KANDATHIRI LEGHIYAM **0.28mg/kg(po)**	22±2.309**	51.46 %

EFFECT OF KANDATHIRI LEGHIYAM WITH HONEY/GHEE ON ACETIC ACID INDUCED WRITHING IN MICE[1]

GROUP	No of Writhing (30min)	Inhibition (%)
CONTROL	45.33±4.807	---
Indomethacin (5mg/kg, i.p)	22.67±1.764***	49.98 %
KANDATHIRI LEGHIYAM **0.028mg/kg(po)**	33.33±1.764*	26.47 %
KANDATHIRI LEGHIYAM **0.014mg/kg(po)**	26.33±1.453**	41.91 %
KANDATHIRI LEGHIYAM **0.28mg/kg(po)**	22±2.309**	51.46 %

Values are expressed as the mean ± S.D; Statistical significance (p)calculated by one way ANOVA followed by dunnett's ns- no significant $^{*}P< 0.001$, $^{**}P < 0.01$, $^{***}P < 0.05$ calculate by comparing treated group with CONTROL group.



EFFECT OF KANDATHIRI LEGHIYAM WITH HONEY/GHEE ON HOT PLATE METHOD IN MICE[1]

1. Turner RA. Screening methods in pharmacology. In: Turner, R., Hebborn, P. (eds.). Academic press, New York. 1965; 100.

The paws of mice and rats are very sensitive to heat at temperatures which are not damaging the skin. The responses are jumping, withdrawal of the paws and licking of the paws.

MATERIAL AND METHODS

ANIMALS:

Healthy Swiss albino rats of either sex weighing 20-25g were used in this study. All the animals were obtained from Animal house of the KMCH College of Pharmacy, Coimbatore. The animals were housed comfortably in a group of six in a single clean plastic cage with a metal frame lid on its top. They were housed under standard environmental conditions of temperature (24±1°C) and relative humidity of 30-70 %. A 12:12 h light dark cycle was followed. All animals had free access to water and standard pelletized laboratory animal diet ad libitum. All the experimental procedures and protocols used in this study were reviewed and approved via the Approval No. ---------- by the Institutional Animal Ethical Committee (IAEC) of KMCH College of Pharmacy, Coimbatore (685/PO/Re/S/2002/CPSCEA Dated 21st August 2002 constituted in accordance with the guidelines of the CPCSEA, Government of India.

The hot plate, which is commercially available, consists of a electrically heated surface. The temperature is controlled for 55° to 56 °C. This can be a copper plate or a heated glass surface. The animals are placed on the hot plate and the time until either licking or jumping occurs is recorded by a stop-watch.

EXPERIMENTAL PROCEUDRE:

GROUP 1 – CONTROL

GROUP 2 – Pentazocine (10mg/kg, I.P)

GROUP 3 -- KANDATHIRI LEGHIYAM WITH HONEY/GHEE
3.24 mg /kg(po)

GROUP 4 – KANDATHIRI LEGHIYAM WITH HONEY/GHEE
16.2mg/kg(po)

GROUP 5 -- KANDATHIRI LEGHIYAM WITH HONEY/GHEE
81mg/kg(po)

PROCEUDRE:

Mice were screened by placing them on a hot plate maintained at 55±1ºC and recording the reaction time in seconds for forepaw licking or jumping. Only mice which reacted within 15sec and which did not show large variation when tested on four separate occasions, each 15min apart, were taken for the test. The time for forepaw licking or jumping on the heated plate of the analgesiometer maintains at 55ºC was taken as the reaction time. Prior to treatment, the reaction time of each mouse (licking of the forepaws or jumping response) was done at 0- and 10-min interval. The average of the two readings was obtained as the initial reaction time (*Tb*). The reaction time (*Ta*) following the administration of the ----------, Pentazocine and distilled water was measured at 0.5, 1, 2, and 3h after latency period of 30min.

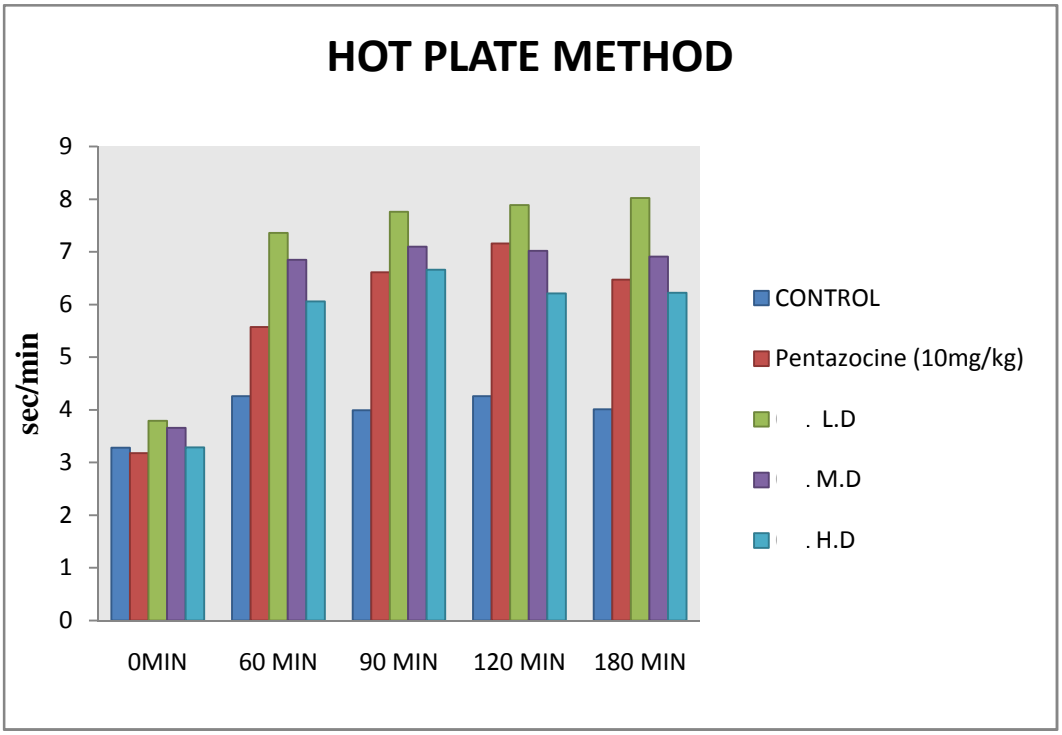
The following calculation was:

Percentage analgesic activity = $Ta\text{-}Tb/Tb \times 100$

EFFECT OF KANDATHIRI LEGHIYAM WITH HONEY/GHEE ON HOT PLATE METHOD IN MICE[1]

GROUP	Reaction time in seconds at time (minutes) (mean ± sem) (mean ± sem)				
	O mints	60 mints	90 mints	120 mints	180 mints
CONTROL	3.288±0.112	4.26±0.022	3.99±0.3266	4.26±0.23	4.01±0.08841
STANDARD	3.185±0.119	5.57±0.297**	6.613±0.053***	7.16±0.24***	6.473±0.2101**
KL + LOW DOSE	3.79±0.214	7.36±0.190***	7.767±0.22***	7.89±0.25***	8.02±0.08196***
KL + MIDDLE DOSE	3.66±0.116	6.85±0.200**	7.105±0.089**	7.02±0.25***	6.913±0.204**
KL + HIGH DOSE	3.29±0.0426	6.063±0.100**	6.663±0.125***	6.21±0.12***	6.22±0.3477**

Values are expressed as the mean ± S.D; Statistical significance (p)calculated by one way ANOVA followed by dunnett's $^{***}P< 0.001$, $^{**}P < 0.01$, $^{*}P < 0.05$ calculated by comparing treated group with CONTROL group.


HOT PLATE METHOD
sec/min
9
8
7
6
5
4
3
2
1
0
0MIN
60 MIN
90 MIN
120 MIN
180 MIN
CONTROL
Pentazocine (10mg/kg)
. L.D
. M.D
. H.D

ACUTE TOXICITY STUDY IN FEMALE WISTER RATS TO EVALUATE TOXICITY PROFILE OF KANDATHIRI LEGIYAM WITH GHEE AND PALM JAGGERY

Table 1. Test substance details

Name of the test substance	**KANDATHIRI LEGHIYAM** **With Honey/Ghee**
Colour of the test substance	- brown
Nature of the test substance	Powder

Table 2. Experimental protocol

Name of the study	Acute toxicity
Guideline followed	OECD 423 method-acute toxic class method
Animals	Healthy young adult female wister rats, nulliparous, non-pregnant
Body weight	150-200 g
Sex	female
Administration of dose and volume	6000 mg/kg in 200g body weight, single dose in 1 ml
Number of groups and animals	5 groups and 3 animals in each group 1000,2000,3000,5000and 6000mg/kg
Route of administration	Oral Cavage (po)
Vechicle	GHEE AND PALM JAGGERY

Table3. Housing and feeding conditions

Room temperature	22°C ± 3°C
Humidity	40-60%
Light	12 h : 12h (light : dark cycle)
Feed	Standard laboratory animal food pellets with water *ad libitum*

Table 4. Study period and observation parameters

Initial once observation	First 30 minutes and periodically 24 h
Special attention	First 1-4 h after drug administration
Long term observation	Up to 14 days
Direct observation parameters	Tremors, convulsions, salivation, diarrhea, lethargy, sleep and coma.
Additional observation parameters	Skin and fur, eyes and mucous membrane, respiratory, circulatory, autonomic and central nervous systems, somato motor activity and behavior pattern etc.

The time of death, if any, is recorded. (Complete observations: annexure I). After administration of the drug, food is withheld for a further 1-2 hours.

Study procedure

Acute oral toxicity was performed as per organization for economic co-operation for development (OECD) guideline 423 method. The **KANDATHIRI LEGIYAM WITH GHEE AND PALM JAGGERY** was administered in a single dose by tuberculin syringe. Animals are fasted 3 h prior to dosing (food was withheld for 3 h but not water). Following the period of fasting animals was weighed and test substance was administered orally at a dose of 1000,2000,3000,5000 and 6000mg/kg. After the **KANDATHIRI LEGIYAM WITH GHEE AND PALM JAGGERY** administration food was withheld 2 h in mice. Animals are observed individually after at least once during the first 30 minutes, periodically during the first 24 hrs, with special attention given during the first 4 hrs, and daily thereafter, for a total of 14 days.

REPORT

Toxicological evaluation of KANDATHIRI LEGIYAM WITH GHEE AND PALM JAGGERY

Table:5 Effect of **KANDATHIRI LEGIYAM WITH GHEE AND PALM JAGGERY** on acute toxicity test in female rats

S.N	Response	Head		Body		Tail	
		Before	After	Before	After	Before	After
1	Alertness	Normal	Normal	Normal	Normal	Normal	Normal
2	Grooming	Absent	Absent	Absent	Absent	Absent	Absent
3	Touch response	Absent	Absent	Absent	Absent	Absent	Absent
4	Torch response	Normal	Normal	Normal	Normal	Normal	Normal
5	Pain response	Normal	Normal	Normal	Normal	Normal	Normal
6	Tremors	Absent	Absent	Absent	Absent	Absent	Absent
7	Convulsion	Absent	Absent	Absent	Absent	Absent	Absent
8	Righting reflux	Normal	Normal	Normal	Normal	Normal	Normal
9	Gripping strength	Normal	Normal	Normal	Normal	Normal	Normal
10	Pinna reflux	Present	Present	Present	Present	Present	Present
11	Corneal reflux	Present	Present	Present	Present	Present	Present
12	Writhing	Absent	Absent	Absent	Absent	Absent	Absent
13	Pupils	Normal	Normal	Normal	Normal	Normal	Normal
14	Urination	Normal	Normal	Normal	Normal	Normal	Normal
15	Salivation	Normal	Normal	Normal	Normal	Normal	Normal
16	Skin colour	Normal	Normal	Normal	Normal	Normal	Normal
17	Lacrimation	Normal	Normal	Normal	Normal	Normal	Normal

RESULT:

From acute toxicity study it was observed that the administration of **KANDATHIRI LEGIYAM WITH GHEE AND PALM JAGGERY** to Female Wister rats did not induce drug-related toxicity and mortality in the animals up to 6000mg/kg in 200g female Wister rats. So No-Observed-Adverse-Effect- Level

(NOAEL) of **KANDATHIRI LEGIYAM WITH GHEE AND PALM JAGGERY** is 6000 mg/kg equal to human dose

DISCUSSION

KANDATHIRI LEGIYAM WITH GHEE AND PALM JAGGERY was administered single time at the doses of 1000,2000,3000,5000 and 6000mg/kg to female Wister rats and observed for consecutive 14 days after administration. Doses were selected based on the pilot study and literature review. All animals were observed daily once for any abnormal clinical signs. Weekly body weight and food consumption were recorded. No mortality was observed during the entire period of the study. Data obtained in this study indicated no significance physical and behavioral signs of any toxicity due to administration of **KANDATHIRI LEGIYAM WITH GHEE AND PALM JAGGERY** at the doses of 1000,2000,3000,5000 and 6000mg/kg to female Wister rats

At the 14th day, all animals were observed for functional and behavioral examination. In functional and behavioral examination, home cage activity, hand held activity were observed. Home cage activities like Body position, Respiration, Clonic involuntary movement, Tonic involuntary movement, Palpebral closure, Approach response, Touch response, Pinna reflex, Sound responses, Tail pinch response were observed. Handheld activities like Reactivity, Handling, Palpebral closure, Lacrimation, Salivation, Piloercetion, Papillary reflex, abdominal tone, Limb tone were observed. Functional and behavioral examination was normal in all treated groups. Food consumption of all treated animals was found normal as compared to normal group.

SUMMARY & CONCLUSION:

Summary:

The present study was conducted to know single dose toxicity of **KANDATHIRI LEGIYAM WITH GHEE AND PALM JAGGERY** on female Wister rats. The study was conducted using 15 female Wister rats. The female animals were selected for study of 8- 12 weeks old with weight range of within ± 20 % of mean body weight at the time of randomization. The groups were numbered as group I, II, III, IV and V and dose with **1000,2000,3000,5000 and 6000mg/kg** of **LACTIC ACID BACTERIA**. The drug was administered by oral route single time and

observed for 14 days. Daily the animals were observed for clinical signs and mortality.

There were no physical and behavioral changes observed in Female Wister rats during 14 days. Mortality was not observed in any treatment groups.

Conclusion:

The study shows that **KANDATHIRI LEGIYAM WITH GHEE AND PALM JAGGERY** did not produce any toxic effect at dose of **1000,2000,3000,5000 and 6000mg/kg** to rats. So No-Observed-Adverse-Effect-Level (NOAEL) of **KANDATHIRI LEGIYAM WITH GHEE AND PALM JAGGERY** is 6000 mg/kg.

7.0 ABBREVIATIONS

No.	Number
Mg	Milligram
Kg	Kilogram
LD_{50}	Lethal Dose $_{50}$
p.o	peros
ML	Milliliter
%	percentage
R&D	Research and Development
g%	Gram percentage
g	Gram
NOAEL	No-Observed-Adverse-Effect-Level
MLD	Minimum Lethal Dose
MTD	Maximum Tolerated Dose
OECD	Organisation of Economic Co-operation and Development
CPCSEA	Committee for the Purpose of Control and Supervision of Experiments on Animals

8.0 REFERENCES:

1. OECD. Guideline for Testing of Chemicals 423, Acute oral toxicity (acute toxic class method). December 2001.

SUB-ACUTE TOXICITY STUDY IN WISTER RATS TO EVALUATE TOXICITY PROFILE OF KANDATHIRI LEGIYAM WITH GHEE AND PALM JAGGERY

Objective

The objective of this study is to evaluate the toxic effects, if any, as a result of the repeated once daily oral administration of **KANDATHIRI LEGIYAM WITH GHEE AND PALM JAGGERY**to Wister Albino rats for a minimum period of 28 consecutive days. This study will provide information on any major toxic effects, target organs and a rationale for concluding the No-Observed-Adverse-Effect-Level (NOAEL) and/or No Observed Effect Level (NOEL) / LOEL (Low Observed Effect Level) and risk assessment in humans.

1. TEST GUIDELINES

This study plan is prepared as per the following guidelines:

Schedule – Y, Amendment version 2005, Drugs and Cosmetics Rules, 1945.

OECD – 407 – Repeated dose 28-day Oral Toxicity Study in Rodents, Adopted 3 October, 2008.

1.1. Test System Details

Species	:	Rat
Strain	:	Wister Albino
Source	:	Sree Venkateshwara Enterprises Pvt Ltd, Bangalore
Age	:	6-8 weeks
Sex	:	Male / Female (nulliparous and non-pregnant)
Body weight	:	160.0to 180.0 g

1.2. Acclimatization

Animals will be allowed to acclimatize to the experimental room conditions for five days prior to the commencement of dosing. During the acclimatization period, the animals will be observed daily for any apparent adverse clinical signs. Prior to assignment to the study and commencement of treatment, a detailed physical health examination will be performed on all animals by a veterinarian and animals with any evidence of ill health or poor physical condition will not selected for the study.

1.3. Randomization and Grouping

On the starting day of dosing, the animals will be weighed and health examination will be performed by veterinarian. Animals will be randomly allocated to different groups according to their body weight by using MS-Excel sheet as described in the randomization SOP. Animals will be divided into four groups (vehicle control, low, intermediate, and high dose). At the initiation of the treatment, the body weight variation between the groups did not exceed ±20% of the mean weight of each sex.

1.4. Animal Identification

In each cage, animals will be identified with numbers by marking at the base of the ear. The cages will be identified with an attached colored cage label showing study number, study code, group number, sex, dose, strain, species, cage number, route of administration and animal number.

2. ANIMAL HUSBANDRY

2.1. Animal Welfare and approval

The study was approved by the IAEC (SLS) and Committee for the Purpose of Control and Supervision of Experiments on Animals (CPCSEA registration number: Abc14).Their recommendations regarding animal care and handling will be followed.

2.2. Environmental Conditions

The temperature of the experimental room will be maintained at 22±3^{0}C and the relative humidity between 30-70 %. The photoperiod will be 12 hours light and 12 hours dark cycles

2.3. Housing Conditions

Two animals will be housed in autoclaved polypropylene rat cages (Size in mm=L x W x H: 430 x 290 x 160) using paddy husk as the bedding material. Each cage will be fitted with a top grill having provision for keeping rodent pellet feed and an autoclaved polypropylene water bottle with stainless steel drinking nozzle. Cages will be placed on 3-tier racks and cage rotation will be performed every week. Cages will be changed at least twice a week. The cages and water bottles will be cleaned and autoclave sterilized.

2.4. Sanitation

Each day, the floor of the animal room will be swept and mopped. Cages and bedding material will be changed once in three days and water bottles will be changed daily. All the experimental procedures will be done in a clean environment.

2.5. Feed

The experimental animals will be provided with irradiated rodent pellet feed *ad libitum* supplied from Sai feeds Pvt ltd, Chennai . Feed will be withheld for four hours prior to blood collection and necropsy.

2.6. Drinking Water

Animals will be provided with filtered drinking water *ad libitum* passed through water filter system (Aquaguard™) in autoclaved polypropylene bottles. Water bottles will be changed daily. Microbial analysis of water will be carried out once monthly and the report is maintained in the study file.

3. PERSONNEL SAFETY

All personnel handling animals undergo regular medical examination. Protective clothing like apron, face mask, head cap, and gloves will be used to maintain hygienic conditions.

4. MATERIALS AND METHODS

4.1. Preparation of Dose formulation

The dose formulation will be prepared under aseptic conditions as per SLS, SOP.

4.2. Route of Administration and Justification

Administration will be by oral gavage, as it is one of the possible routes of exposure.

4.3. Frequency and Duration of Administration

Once daily for 28 consecutive days

4.4. Dosing Procedure

The test item will be administered in once daily by oral gavage using a suitable intubation cannula fitted with a graduated syringe. The scheme of dosing and sacrifice time points are presented in the below below Table.

4.5. Experimental Procedures

All experimental procedures will be performed in accordance with the Study plan and Standard Operating Procedures (SOPs) of SLS.

4.6 DOSAGE SCHEDULE:

The required dose for mice/rat will be calculated by using the standard dose calculation procedure from recommended clinical dose.

CONVERSION FORMULA:

Human dose is 6000 mg /kg day

Total clinical dose (a) x conversion factor (b) 0.018 = (c) per 150 gm of Rat

6000 mg x 2(a) x 0.018 (b) = 108 (c) /150 gm of Rat

108/1000x150 = 16.2 mg

Experimental Doses Calculated as per the standard procedures are

S.No	Groups	Dose /kg, weight	Volume of administration
1	Vehicle Control	--	1 ml
2	Therapeutic Dose	16.2 mg /kg	1 ml
3	Middle Dose	81mg/kg	1 ml
4	High Dose	405mg/kg	1 ml

1.1.10 Experimental Design

Group No.	Group	Dose (mg/kg b.wt /day)	No. of Animals	
			Male	Female
G1	Vehicle control	**HONEY/GHEE**	5	5
G2	Low dose of **KANDATHIRI LEGIYAM WITH GHEE AND PALM JAGGERY**	16.2m g /kg	5	5
G3	Intermediate dose **KANDATHIRI LEGIYAM WITH GHEE AND PALM JAGGERY**	81mg/kg	5	5
G4	High dose **KANDATHIRI LEGIYAM WITH GHEE AND PALM JAGGERY**	405mg/kg	5	5

5. OBSERVATIONS

Animals will be observed daily throughout the treatment period at regular intervals. During the treatment period, animals will be observed twice daily for any clinical signs of toxicity, morbidity and mortality. All the surviving animals will be sacrificed at the end of scheduled period and subjected to gross necropsy and histopathological evaluations.

5.1.Clinical Signs

All the animals will be subjected to cage-side (home-cage) observations twice a day for any clinical signs of toxicity, preferably at the same time each day and considering the peak period of anticipated effect. In addition to home cage observations, a detailed clinical examination will be performed once prior to dosing and weekly thereafter during treatment period.

5.2. Morbidity/ Mortality

All animals will be examined twice a day for mortality and signs of morbidity.

5.3. Body Weights

Body weights will be recorded at the beginning of acclimatization, before randomization, there after at weekly intervals and at the time of necropsy.

5.4. Feed Consumption

Feed consumption will be calculated on a weekly basis throughout the study period.

5.5. Hematology and Clinical Biochemistry

Hematology and clinical biochemistry tests will be performed with terminally collected blood samples on day-29 from all animals. Animals will be deprived of feed overnight and blood samples will be collected by tapping the ear for visibility of the vein site and inserted the needle into the marginal ear vein and collected the blood

into micro centrifuge tube. Approximately 0.5 ml of blood will be collected in vials containing 1% EDTA (20µl) as an anticoagulant for hematological analysis.

Approximately 2 ml blood will be collected from each animal in micro centrifuge tubes containing 15µl of heparin (19 units) and the plasma will be separated by centrifugation at 4000 rpm for ten minutes at 4^{o}C. The plasma will be stored at -20 ^{o}C ± 2 and used for all clinical chemistry analysis.

5.6. Hematology

Erythrocyte count (RBC), Total Leucocyte count (WBC), Hemoglobin (Hb), Hematocrit (HCT), Mean Corpuscular Volume (MCV), Mean Corpuscular Hemoglobin (MCH), Mean Corpuscular Hemoglobin Concentration (MCHC) and Platelet (PLTC).

5.7. Clinical Biochemistry

Glucose, Alanine Aminotransferase (ALT), Aspartate Aminotransferase (AST), Alkaline phosphatase (ALP), Total protein, Albumin, Creatinine, Urea, Cholesterol, Triglycerides, Sodium, Potassium, Calcium, and Chloride.

1.1.115.8 Pathology

All animals will be euthanized by CO_2 asphyxiation and subjected to necropsy under the supervision of the veterinary pathologist. Different tissues/organs of thoracic, abdominal and cranial cavities will be examined for any gross pathological changes. Tissues from vehicle control and high dose groups will be subjected to detailed histopathological analysis (Ovaries/ testes, kidneys, liver, lungs). The organs will be fixed using Bouin's (reproductive organs) and 10% neutral buffered formalin (kidneys, liver, spleen, lungs).Processing of tissue will be done by spin tissue processer, embedding of the tissue by tissue embedder. The tissues will be initially trimmed to 10-20µ thickness and later 3-6µ to obtain thinner tissue sections by using rotary microtome. Haematoxylin and Eosin staining will be performed for all tissues.

5.8. Organ Weights

Absolute weights of adrenal glands, brain, ovaries/testes, epididymis/uterus, heart, kidneys, liver, spleen and lungs will be recorded for all the animals after trimming adherent tissue immediately after dissection from the animal. Paired organs will be weighed together. Relative weights of these organs against fasting animal body weights will be calculated and reported.

6. DATA COMPILATION

Data will be summarised in a tabular form showing the number of animals, experimental design, dose groups, dose volume and concentrations, test item and vehicle control details. All findings like clinical signs, mortality and morbidity data, time of death, body weights, feed consumption, clinical signs, and necropsy and pathology observations will be recorded and given in the final report. One original copy of the final report is issued to the sponsor.

7. *STATISTICAL ANALYSIS*

All the parameters of treated groups of both sex, viz. body weight, feed consumption, organ weights (absolute and relative), biochemical parameters, and hematology parameters will be analyzed using SPSS software, version 16.0 by using one-way ANOVA test with multiple comparison (vehicle controls treated groups) in the study report, and p value < 0.05 is considered as statistically significant.

8. *REFERENCES*

1. Committee for the Purpose of Control and Supervision of Experiments on Animals (CPCSEA) guidelines for Laboratory Animal Facility, The Gazette of India, 1998.
2. Hayes AW, 2000. Principles and Methods of Toxicology, 4th ed., Taylor and Francis, London.
3. Karl-Heinz Diehl, R. H. (2001). A Good Practice Guide to the Administration of Substances and Removal of Blood, Including Routes and Volumes. journal of applied toxicology , 15-23.
4. OECD – 407 - Repeated dose 28-day oral Toxicity Study in Rodents, Adopted October 3, 2008.
5. Schedule – Y, Amendment version 2005, Drugs and Cosmetics Rules, 1945.

MATERIALS AND METHODS

ESTIMATION OF HEMATOLOGICAL PARAMETERS: [1]

Collection of blood for hematological studies

After the treatment period the animals were anaesthetized by ketamine hydrochloride and the blood was collected from Retro-orbital sinus by using capillary into a centrifugation tube which contains EDTA for haematological parameters The haematological parameters like RBC, WBC and Hb percentage, Differential cell count, MCV, MCHC, Hematocrit, MCH, platelet count were estimated by the following procedures.

1. ENUMERATION OF RED BLOOD CELLS: [1] Ramnic 2007)

Reagents : RBC diluting fluid

Procedure:

Using a red blood cell pipette of haemocytometer, well mixed blood was drawn up to 0.5 mark and RBC diluting fluid was taken up to mark II. The fluid blood mixture was shaken and transferred onto the counting chamber. The cells were allowed to settle to the bottom of the chamber for 2 min. See the fluid does not get dried. Using 45X or high power objective the RBC's were counted uniformly in the larger corner squares.

The cells were expressed as number of cells $x10^{12}/l$

2. ENUMERATION OF WBC: [2] JOHN 1972)

REAGENTS:

TURK'S FLUID: TURK'S FLUID WAS PREPARED BY MIXING 2ML OF ACETIC ACID WITH 100 ML OF DISTILLED WATER. TO THIS 10 DROP OF AQUEOUS METHYLENE BLUE 3 % W/V) WAS ADDED. THIS SOLUTION HAEMOLYSIS THE RED CELLS DUE TO ACIDITY SO THAT COUNTING OF WHITE CELLS BECOMES EASY.

Procedure:

Using a white blood cell pipette of haemocytometer, well mixed blood was drawn up to 0.5 mark and WBC diluting fluid was taken up to mark II. The fluid blood mixture was shaken and transferred onto the counting chamber. The cells were allowed to settle to the bottom of the chamber for 2 min. See the fluid does not get dried.

Using 10X or low power objective the WBC's were counted uniformly in the larger corner squares.

The cells were expressed as number of cells/10mm.

3. DIFFERENTIAL LEUCOCYTE COUNT: [3] JOHN 1972)

Reagent:

Leishmann's stain: 150mg of powdered leishmann's stain was dissolved in 133ml of acetone free methanol.

Procedure:

A blood film stained with leishmann's stain was examined under oil immersion and the different types of WBCs were identified. The percentage distribution of these cells was then determined. Smears were made from anticoagulant blood specimens and stained with leishmann's stain. The slides were preserved for counting the number of lymphocytes and neutrophils, per 100 cells were noted.

From the different Leukocyte count and WBC count, absolute lymphocyte and neutrophil count were calculated.

$$\text{Absolute neutrophil count} = \frac{\text{Number of neutrophils}}{100} \times \text{TWBC}$$

$$\text{Absolute lymphocyte count} = \frac{\text{Number of lymphocytes}}{100} \times \text{TWBC}$$

DETERMINATION OF BIOCHEMICAL PARAMETERS:

For assessment of biochemical parameters, blood samples were collected from the animals by puncturing the retro-orbital plexus and centrifuged. The serum collected after centrifugation was analyzed for various biochemical parameters like SGOT, SGPT, ALP,TC.TG,HDL All of the above biochemical parameters were estimated using semi autoanalyzer (Photometer 5010 $_{V5+}$, Germany) with enzymatic kits procured from Piramal Healthcare limited, Lab Diagnostic Division, Mumbai, India.

1. Total Cholesterol (TC)

Principle

Determination of cholesterol is done after enzymatic hydrolysis and oxidation. The colorimetric indicator is quinoneimine, which is generated from 4-aminoantipyrine and phenol by hydrogen peroxide under the catalytic action of peroxidase (trinder's reaction).

$$\text{Cholesterol ester} + H_2O \xrightarrow{\text{CHE}} \text{Cholesterol} + \text{Fatty acid}$$

$$\text{Cholesterol} + O_2 \xrightarrow{\text{CHO}} \text{Cholesterol-3-one} + H_2O_2$$

$$2H_2O_2 + \text{4- Amino antipyrine} + \text{Phenol} \xrightarrow{\text{POD}} \text{Quinonelimine} + 4\ H_2O_2$$

Method

CHOD-PAP: Enzymatic photometric test

Table 6: Reagents

Goods buffer (pH 6.7)	50 mmol/ l
Phenol	5 mmol/l
4-aminoantipyrine	0.3 mmol/l
Cholesterol estrase	> 200 U/l
Cholesterol oxidase	> 100 U/l
Peroxidase	3 KU/l
Standard	(5.2 mmol/l)

Assay procedure

a. 1 ml (1000 µl) of reagent-1 is taken in a 5 ml test tube.
b. Added 0.01 ml (10 µl) of serum.
c. Mixed well and incubated at 37°C for 5 min.
d. Read the test sample.

NORMAL RANGE: < 200 mg/dl in serum.

1. Deeg R, Ziegenhorn J, Kinetic enzymatic method for automated determination of total cholesterol in serum, Clin. Chem., 1983, 29:1798-802.

2. Triglycerides

Principle

Determination of triglycerides (TG) alters enzymatic splitting with lipoprotein lipase. Indicator is quinoneimine which is generated from 4-aminoantipyrine and 4- chlorophenol by hydrogen peroxidase under the catalytic action of peroxidase.

$$\text{Triglycerides} \xrightarrow{\text{LPL}} \text{Glycerol + fatty acid}$$

$$\text{Glycerol + ATP} \xrightarrow{\text{GK}} \text{Glycerol-3-phosphate+ ADP}$$

$$\text{Glycerol-3-phosphate} + O_2 \xrightarrow{\text{GPO}} \text{Dihydroxyaceton phosphate} + H_2O_2$$

$$2H_2O_2 + \text{4- Amino antipyrine + 4- chlorophenol} \xrightarrow{\text{POD}} \text{Quinonelimine + HCL} + 4H_2O_2$$

Method

Colorimetric enzymatic test using glycerol-3-phosphate-oxidase (GPO).

Reagents

Components and concentrations in the test Goods buffer pH 7.2, 50 mmol/ l

Table 7: Reagents

4-chloroPhenol	4 mmol/l
ATP	2 mmol/l
Mg^{2+}	15 mmol/l
Glycerokinase	> 0.4 Kμ/l
Peroxidase	> 2 Kμ/l
Lipoprotein lipase	> 4 Kμ/l
4-aminoantipyrine	0.5 mmol/l
Glcerol-3-phosphate- oxidase	> 1.5Kμ/l
Standard	(2.3 mmol/l)

Assay procedure

a. 1 ml (1000 µl) of reagent-1 is taken in a 5 ml test tube.
b. Added 0.01 ml (10 µl) of serum.
c. Mixed well and incubated at 37°C for 15 min.
d. Read the test sample.

Normal Range: < 200 mg/dl in serum.

1. Cole T.G, Klotzsch S.G, Mcnarmara J, Measurement of triglyceride concentration, In Rifai N, Warnick G.R, Dominiczak M.H, Handbook of lipoprotein testing, Washington:AACC, Press, 1997, 115-26.

3. HDL Cholestrol

Principle

Chylomicrons, VLDL and LDL are precipitated by adding phosphotungstic acid and magnesium ions to the sample. Centrifugation leaves only the HDL in the supernatant. The cholesterol content in it is determined enzymatically.

Method

Phosphotungstic acid precipitation method.

Table 8: Reagents

Phosphotungstic acid	0.55 mmol/l
Magnesium chloride	25 mmol/l

Assay procedure

A. Preparation of supernatant for the HDL-CHL estimation

Added 200 µl of serum to the 500 µl of HDL-Cholesterol precipitating reagent (from HDL kit) in 1.5 ml centrifuge tube and mixed well. Centrifuged the above solution at 4000 rpm for 10 min.

B. Preparation of test sample for the estimation of HDL-Cholesterol

a. Taken 1000 µl of reagent-1 (from cholesterol kit) in a 5 ml test tube.
b. Added, 100 µl of supernatant from above centrifuged solution
c. Mixed well and incubated at 37°C for 15 min.
d. Read the test sample.

Normal Range: > 60 mg/dl in serum.

1. Friedewald W.T, Levy R.T, Frederickson D.S, Estimation of VLDL and LDL cholesterol, Clin. Chem., 1972, 18:499-502.

4. ESTIMATION OF SERUM GLUTAMATE PYRUVATE TRANSAMINASES (SGPT/ ALT)

1. Determination of aspartate aminotransferase (AST)

Aspartate aminotransferase, also known as Glutamate Oxaloacetate Transaminase (GOT) catalyses the transamination of L-aspartate and α keto glutarate to form oxaloacetate and L- glutamate. Oxaloacetate formed is coupled with 2,4- Dinitrophenyl hydrazine to form hydrazone, a brown coloured complex in alkaline medium which can be measured colorimetrically.

Reagents

Buffered aspartate (pH 7.4); 2,4- DNPH reagent; 4N sodium hydroxide; working pyruvate standard; solution I (prepared by diluting 1 ml of reagent 3 to 10 ml with purified water).

Procedure

Rietman and Frankle method was adopted for the estimation of SGOT. (Reitmann S, Frankel S, 1957. A colorimetric method for the determination of serum oxaloacetic and glutamic pyruvate transminases. American Journal of Clinical Pathology.28: 56-63.The reaction systems used for this study included blank, standard, test (for each serum sample) and control (for each serum sample). 0.25 ml of buffered aspartate was added into all the test tubes. Then 0.05 ml of serum was added to the test group tubes and 0.05 ml of working pyruvate standard into the standard tubes. After proper mixing, all the tubes were kept for incubation at 37^{o}C for 60 min, after which 0.25 ml each of 2,4- DNPH reagent was added into all the tubes. Then, 0.05 ml of distilled water and 0.05 ml of each serum sample was added to the blank and the serum control tubes respectively. The mixture was allowed to stand at room temperature for 20 min. After incubation, 2.5 ml of solution I was added to all test tubes. Mixed properly and optical density was measured in a spectrophotometer at 505 nm within 15 min.

The enzyme activity was calculated as:-

AST (GOT) activity in IU/L) = [(Absorbance of test **-** Absorbance of control)/ (Absorbance of standard - Absorbance of blank)] x concentration of the standard

2. Determination of alanine aminotransferase (ALT)

Alanine aminotransferase, also known as Glutathione Peroxidase (GPT) catalyses the transamination of L-alanine and α keto glutarate to form pyruvate and L- Glutamate. Pyruvate so formed is coupled with 2,4 – Dinitrophenyl hydrazine to form a corresponding hydrazone, a brown coloured complex in alkaline medium which can be measured colorimetrically.

Reagents

Buffered alanine (pH 7.4), 2,4–DNPH, 4N sodium hydroxide, working pyruvate standard, solution I (prepared by diluting 1 ml of reagent 3 to 10 ml with purified water).

Procedure

Rietman and Frankle method was dopted for the estimation of SGPT. The reaction systems used for this study included blank, standard, test (for each serum sample) and control (for each serum sample). 0.25 ml of buffered alanine was added into all the test tubes. This was followed by the addition of 0.05 ml of serum into the test group tubes and 0.05 ml of working pyruvate standard into the standard tubes. After proper mixing, all the tubes were kept for incubation at 37^{o}C for 60 minutes, after which 0.25 ml each of 2,4- DNPH reagent was added into all the tubes. Then, 0.05 ml of distilled water and 0.05 ml of each serum sample was added to the blank and the serum control tubes respectively. The mixture was allowed to stand at room temperature for 20 min. After incubation, 2.5 ml of solution **I** was added to all test tubes. Mixed properly and optical density was read against purified water in a spectrophotometer at 505 nm within 15 min.

The enzyme activity was calculated as:- ALT (GPT) activity in IU/L) = [(Absorbance of test **-** Absorbance of control)/ (Absorbance of standard - Absorbance of blank)] x concentration of the standard.

3. Determination of alkaline phosphatase (ALP)

Alkaline phoshatase from serum converts phenyl phosphate to inorganic phosphate and phenol at pH 10.0. Phenol so formed reacts in alkaline medium with 4-aminoantipyrine in presence of the oxidising agent potassium ferricyanide and forms an orange-red coloured complex, which can be measured spectrometrically. The color intensity is proportional to the enzyme activity.

Reagents:

Buffered substrate

Chromogen Reagent

Phenol Standard, 10 mg%

Procedure:

ALP was determined using the method of Kind (Kind PRM, King EJ, 1972. *In-vitro* determination of serum alkaline phosphatase. Journal of Clinical Pathology 7: 321-22\). The working solution was prepared by reconstituting one vial of buffered substrate with 2.2 ml of water. 0.5 ml of working buffered substrate and 1.5 ml of purified water was dispensed to blank, standard, control and test. Mixed well and incubated at 37^{0}C for 3 min. 0.05 ml each of serum and phenol standard were added to test and standard test tubes respectively. Mixed

well and incubated for 15 min at 37^0C. Thereafter, 1 ml of chromogen reagent was added to all the test tubes. Then, added 0.05 ml of serum to control. Mixed well after addition of each reagent and the O.D of blank, standard, control and test were read against purified water at 510 nm.

Serum alkaline phosphatase activity in KA units was calculated as follows
[(O.D. Test-O.D. Control) / (O.D. Standard- O.D. Blank)] x 10

4. Determination of bilirubin

In toxic liver, bilirubin levels are elevated. Hyperbilirubinemia can result from impaired hepatic uptake of unconjugated bilirubin, such a situation can occur in generalized liver cell injury, certain drugs (e.g Rifampin and probenecid) interfere with the rat uptake of bilirubin by the liver cell and may produce a mild unconjugated hyperbilirubinemia. Bilirubin level rises in diseases of hepatocytes, obstruction to bilirubin excretion into duodenum, in haemolysis and defects of hepatic uptake and conjugation of Bilirubin pigment such as Gilbert's disease.

Elevation of total serum bilirubin may occur due to:

1.Excessive haemolysis or destruction of the red blood cells.Eg:Haemolytic disease of the new born.

2.Liver diseases.Eg.Hepatitis and cirrhosis.

3.Obstruction of the biliary tract.Eg.Gall stones.

The method is based on the reaction of Sulfonilic acid with sodium nitrite to form azobilirubin which has maximum absorbance at 546nm in the aqueous solution. The intensity of the color Produced is directly proportional to the amount of direct or total bilurubin concentration present in the sample.

Reagents

1. Diazo A-(Reagent-R1) :Ready to use

2. Diazo B-(Reagent-R2):Ready to use

3. Bilirubin Activater :Ready to use

Procedure

Kind & King's method was followed for the estimation of Bilirubin. Five hundred µl of working reagent was added to 50 µl of rat serum & incubated for 5 min at 37°C. Absorbance was measured AT 546 NM in semi auto analyzer against the standard.

The Bilirubin content was calculated using the following equation:

Total bilirubin (mg/dt) = Abs of the sample blank x 15.

Direct Bilirubin(mg/dt) = Abs of sample blank x 10.

5. ESTIMATION OF UREA

Urea is the nitrogen-containing end product of protein catabolism. States associated with elevated levels of urea in blood are referred to as hyper uremia or azotemia.

Method

Estimation of urea was done by Urease-GLDH: enzymatic UV test.

Principle

$$Urea + 2H_2O \xrightarrow{Urease} 2NH_4 + 2HCO_3$$

$$2\text{- Oxoglutarate} + NH_4^+ + NADH \xrightarrow{GLDH} \text{L- Glutamate} + NAD^+ + H_2O$$

Table 14. Reagents

R 1	TRIS pH 7.8	120 mmol/l
	2-Oxoglutarate	7 mmol/l
	ADP	0.6 mmol/l
	Urease	≥ 6 KU/l
	GLDH	≥ 1 KU/l
R 2	NADH	0.25 mmol
R 3	Standard	40 mg/dl

Procedure

a. Take 1000 µl of reagent-1 and 250 µl of reagent-2 in 5 ml test tube.
b. To this, add 10 µl of serum.
c. Mix well and immediately read the test sample at 340 nm Hg 334 nm Hg 365 nm optical path 1 cm against reagent blank (2-point kinetic).
d. And note down the value.

Normal range: 10 – 50 mg/dl.

6. ESTIMATION OF URIC ACID

Uric acid and its salts are end products of the purine metabolism. In gout the most common complication of hyperuricemia, ie. Increased serum levels of uric acid lead to formation of monosodium urate crystal around the joints.

Method

Enzymatic photometric test using TOOS (N ethyl- N (hydroxyl -3- sulfopropyl)-m-toluidin)

Principle

Uric acid + H_2O + O_2 $\xrightarrow{\text{uricase}}$ Allantoin +CO_2 +H_2O_2

TOOS + 4 aminoantipyrine + $2H_2O_2$ $\xrightarrow{\text{POD}}$ Indamine + $3H_2O$

Table 15.reagents

R1	Phosphate buffer pH 7.0	100mmol/l
	TOOS	1mmol/l
	Ascorbate oxidase	≥1 KU/l
R2	Phosphate buffer pH 7.0	100mmol/l
	4- amino antipyrine	0.3mmol/l
	K_4 (Fe(CN)$_6$)	10µmol/l
	Peroxidase	≥1KU/l
	Uricase	≥50U/l

Procedure

a. Take 800µl of reagents -1 in a2ml centrifuge tube.
b. To this add 20µl of serum.
c. Mix well and incubate at 30°c for 5 minutes.
d. Then add 200µl of reagent2
e. Mix well incubate for 5min at 37°c
f. Measure the not down the values.

Normal range: 1.9-8.2mg/dl

7. ESTIMATION OF CREATININE:

Principle:

Creatinine forms a coloured complex with picrate in alkaline medium.

The rate of formation of the complex is measured.

Reagents:

Reagent 1 Standard Creatinine (2mg/100ml)

Reagent 2 Picric acid solution.

Reagent 3 sodium hydroxide solution

Procedure:

Take 500 µl of reagent -2 and 500 µl of reagent -3 in a 5ml test tube. To this add 100 µl of serum. Mix well and immediately read the test sample at Hg 492 nm 1cm light path and note down the values.

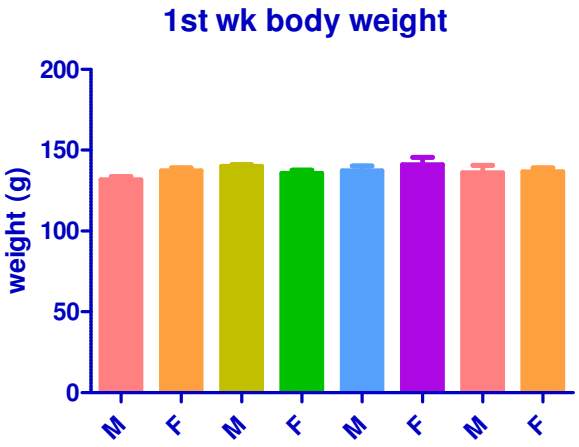
Normal range is 0.6 -1.1 mg/dl.

TABLE: 1 EFFECT OF SUB-ACUTE DOSES (28 DAYS) OF KANDATHIRI LEGIYAM WITH GHEE AND PALM JAGGERY ON BODY WEIGHT IN Gram (PHYSICAL PARAMETER)

Effect Of Sub Acute Doses (28 Day) 0f Kandathiri Legiyam With Ghee And Palm Jaggery On Body Weight In Gram (Physical Parameter).

GPs	Control		Low Dose		Middle Dose		High Dose	
	Male	Female	Male	Female	Male	Female	Male	Female
1st wk	131.7± 2.028	137.3± 1.764	140± 1.155	135.7± 2.028	137.3± 2.906	141± 4.509	136± 4.619	136.7± 2.404
2nd wk	138.3± 2.028	145.3± 1.667	147±1	141.3± 1.856	144.3± 2.728	146.7± 4.485	141± 2.517	144± 2.082
3rd wk	145± 2.082	153.7± 2.603	155.3± 1.453	148.3± 2.404	152± 3.055	154.7± 3.844	149.3± 2.603	153± 2.887
4th wk	157.7± 0.8819	163± 2.517	162.3± 1.764	157.7± 2.603	160.7± 1.856	163.7± 3.93	157.3± 2.404	159.7± 2.333

Values are expressed as the mean ± S.D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F
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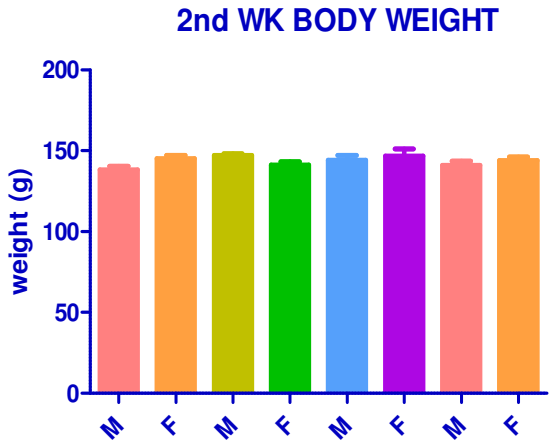
M
F
M
F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weight (g)
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50
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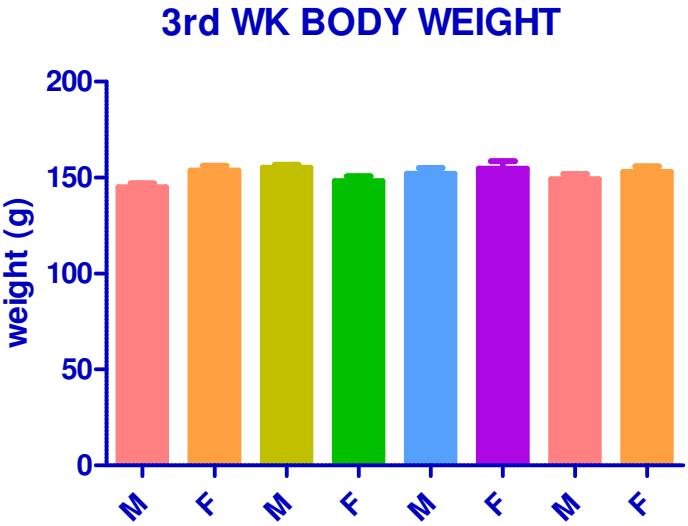
M
F
M
F
M
F
M
F


3rd WK BODY WEIGHT
weight (g)
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M
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M
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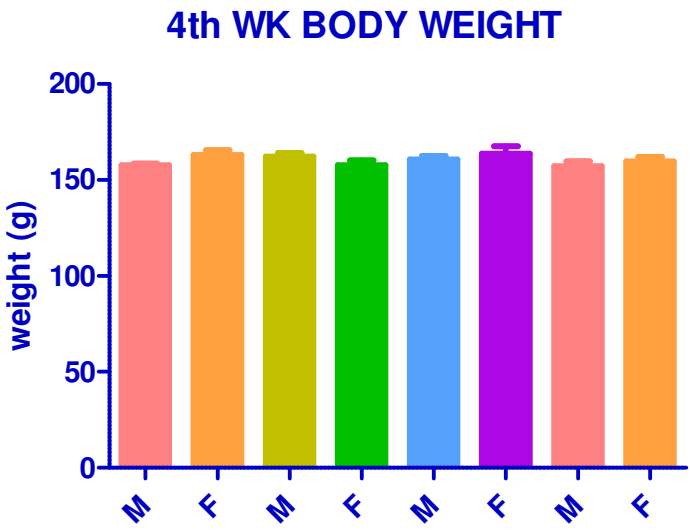
M
F
M
F



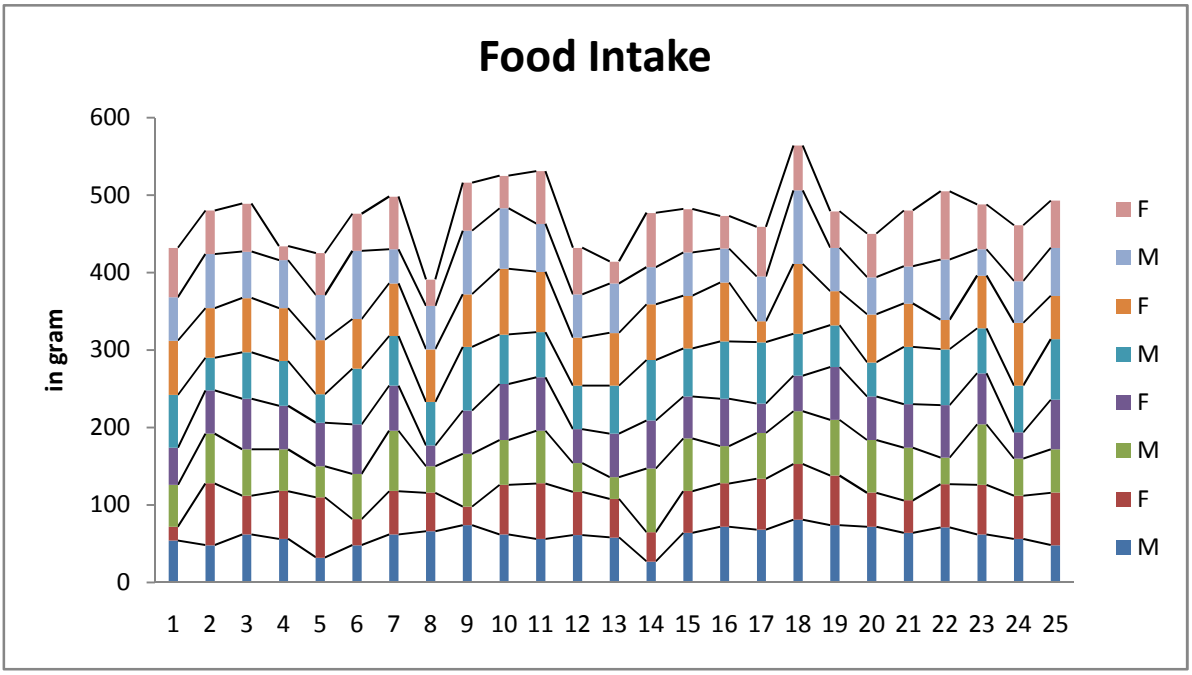
EFFECT OF SUB-ACUTE DOSES (28 DAYS) OF KANDATHIRI LEGIYAM WITH GHEE AND PALM JAGGERY ON FOOD INTAKE In Gram

Effect Of Sub Acute Doses (28 Days) 0f KANDATHIRI LEGIYAM WITH GHEE AND PALM JAGGERY ON FOOD INTAKE IN Gram

Groups	Control		Low Dose		Middle Dose		High Dose	
DAY	Male	Female	Male	Female	Male	Female	Male	Female
Day 1	54	18	54	48	68	70	56	64
DAY2	48	80	64	56	42	64	70	56
DAY3	62	50	60	65	60	70	60	62
Day 4	56	62	54	56	58	68	62	18
DAY5	32	78	40	56	37	70	58	54
Day 6	48	34	58	64	72	64	88	48
DAY7	62	56	78	58	64	68	44	68
DAY8	66	50	34	27	56	68	56	34
Day 9	74	24	68	56	82	68	82	62

DAY10	62	64	58	72	64	85	78	42
Day 11	56	72	68	69	58	78	62	68
DAY12	61	56	37	44	56	62	56	60
DAY13	58	50	28	56	62	68	64	28
Day 14	27	38	82	62	78	72	48	70
DAY15	64	54	68	54	62	68	56	56
Day 16	72	56	48	61	74	76	44	42
DAY17	68	66	59	38	79	27	58	64
DAY18	81	72	68	46	54	90	95	58
Day 19	74	64	72	68	54	44	56	47
DAY20	72	44	68	56	44	62	48	56
DAY21	64	42	68	56	74	56	48	72
Day 22	71	56	34	68	72	38	78	88
DAY23	62	64	78	66	58	68	34	58
DAY24	56	56	48	34	60	81	54	72
Day 25	48	68	56	64	78	56	62	61
DAY26	39	38	14	87	81	46	52	79
DAY27	54	18	54	48	68	70	56	64
DAY28	48	80	64	56	42	64	70	56

Values are expressed as the mean ± S.D



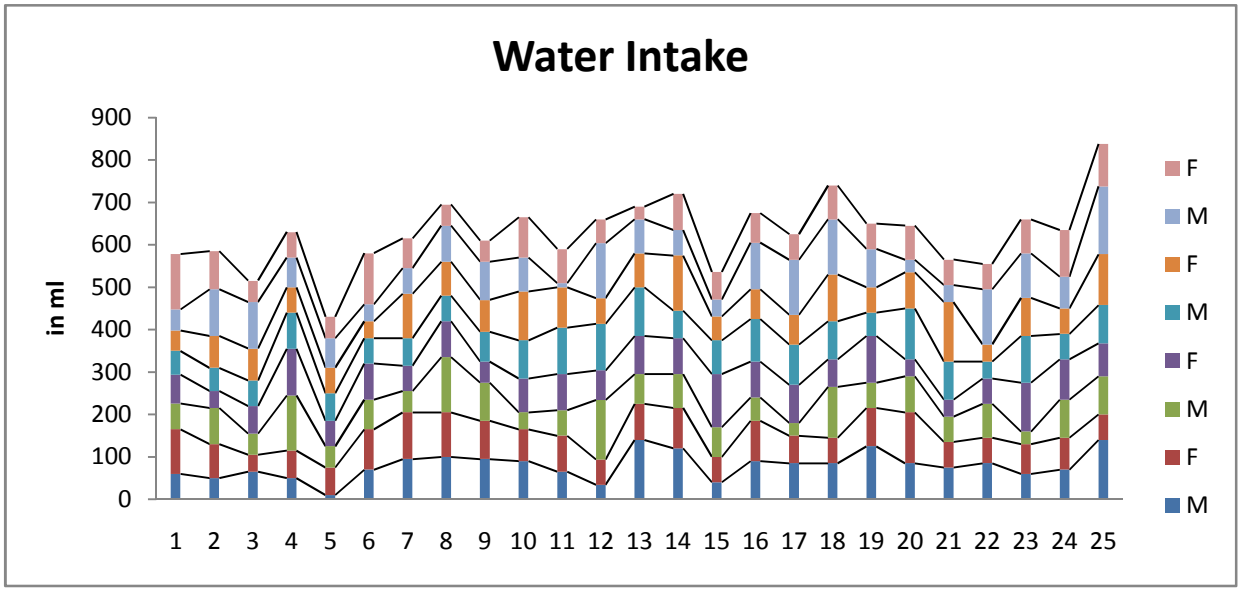
EFFECT OF SUB-ACUTE DOSES (28 DAYS) OF KANDATHIRI LEGIYAM WITH GHEE AND PALM JAGGERY ON WATER INTAKE IN ml

Effect Of Sub Acute Doses (28 Day) 0f KANDATHIRI LEGIYAM WITH GHEE AND PALM JAGGERYon Water Intake in ml

Groups	Control		Low Dose		Middle Dose		High Dose	
DAY	Male	Female	Male	Female	Male	Female	Male	Female
Day 1	60	105	61	68	56	48	50	130
DAY2	50	80	85	40	55	75	110	90
DAY3	65	40	50	65	60	75	110	50
Day 4	50	65	130	110	85	60	70	60
DAY5	10	65	50	60	65	60	70	50
Day 6	70	95	70	85	60	40	40	120
DAY7	95	110	50	60	65	105	60	70
DAY8	100	105	130	85	60	80	85	50
Day 9	95	90	90	50	70	75	90	50

DAY10	90	75	40	80	90	115	80	95
Day 11	65	85	60	85	110	95	10	80
DAY12	34	60	140	70	110	60	130	56
DAY13	140	85	70	90	115	80	80	30
Day 14	120	95	80	85	65	130	60	85
DAY15	40	60	70	125	80	56	40	65
Day 16	90	95	55	85	100	70	110	70
DAY17	85	65	30	90	95	70	130	60
DAY18	85	60	120	65	90	110	130	80
Day 19	125	90	60	110	55	60	90	60
DAY20	85	120	85	40	120	85	30	80
DAY21	75	60	60	40	90	140	40	60
Day 22	85	60	80	60	40	40	130	60
DAY23	60	70	30	115	110	90	105	80
DAY24	70	75	90	95	60	60	75	110
Day 25	140	60	90	78	90	120	160	100
DAY26	60	105	61	68	56	48	50	130
DAY27	50	80	85	40	55	75	110	90
DAY28	65	40	50	65	60	75	110	50

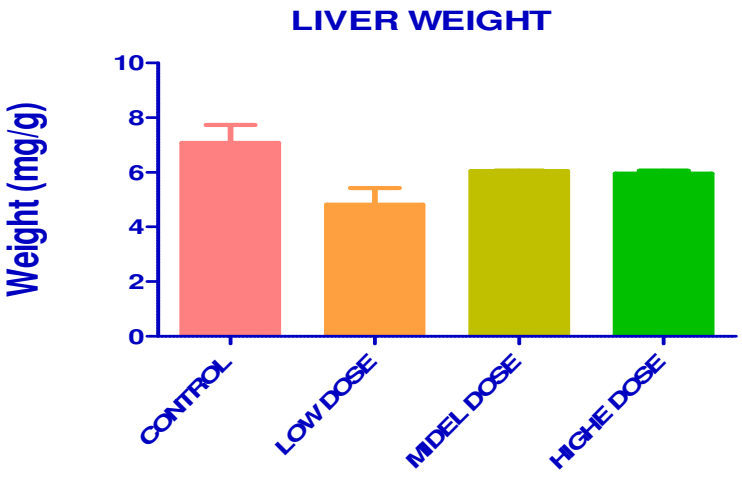
Values are expressed as the mean ± S.D



EFFECT OF SUB-ACUTE DOSES (28 DAYS) OF KANDATHIRI LEGIYAM WITH GHEE AND PALM JAGGERY ON ORGAN WEIGHT in gm

GROUP		CONTROL	Low Dose	Middle Dose	High Dose
LIVER WEIGHT		7.078±0.65	4.811±0.613	6.043±0.012	5.944±0.122
KIDNEY WEIGHT	L	0.987±0.095	0.7055±0.0175	0.7505±0.0325	0.872±0.076
	R	1.306±0.372	0.737±0.045	0.6995±0.0145	0.894±0.032
HEART WEIGHT		0.8855±0.0065	0.9295±0.0635	0.7745±0.0535	1.076±0.1535
LUNGS WEIGHT		2.09±0.298	0.7575±0.0685	1.14±0.284	2.008±0.3205
TESTIS WEIGH		2.713±0.625	2.375±0.649	1.978±0.55	2.627±0.5995
UTERUS		0.442±0.08	0.5005±0.0455	0.3905±0.0385	0.739±0.037

Values arae expressed as mean ± SEM Statistical significance (p) calculated by one way ANOVA followed by dunnett's (n=6); $^{ns}p>0.05$, *p<0.05, **p<0.01, ***p<0.001, calculated by comparing treated groups with control group.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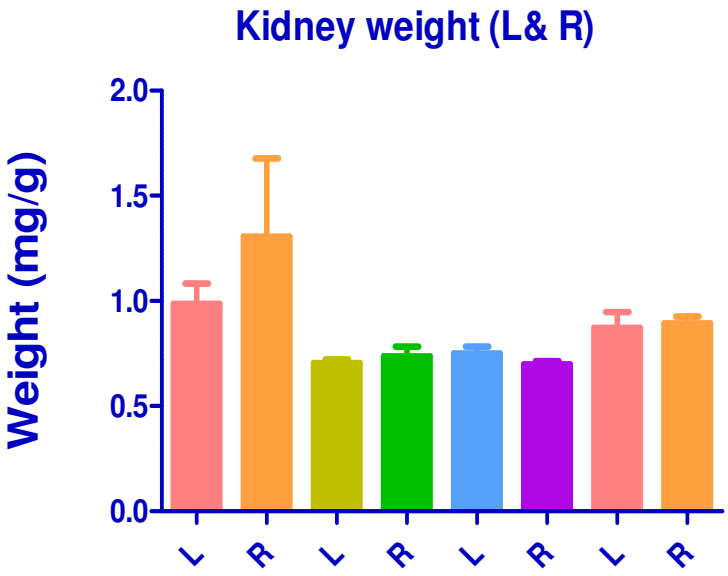
CONTROL
LOW DOSE
MIDEL DOSE
HIGHE DOSE


Kidney weight (L& R)
Weight (mg/g)
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L
R
L
R
L
R
L
R


HEART WEIGHT
Weight (mg/g)
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1.0
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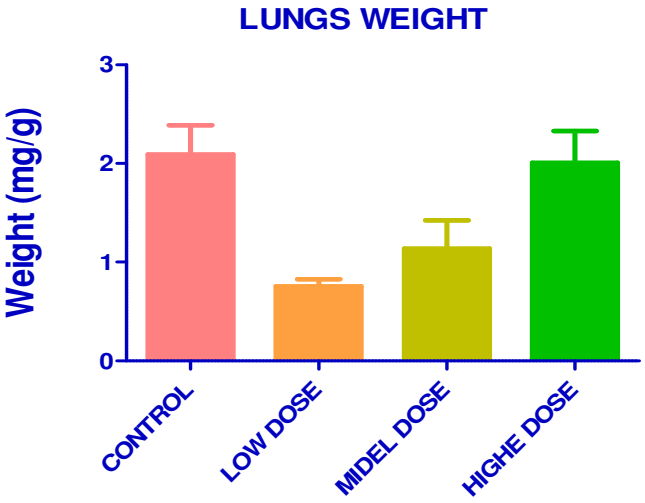
CONTROL
LOW DOSE
MIDEL DOSE
HIGHE DOSE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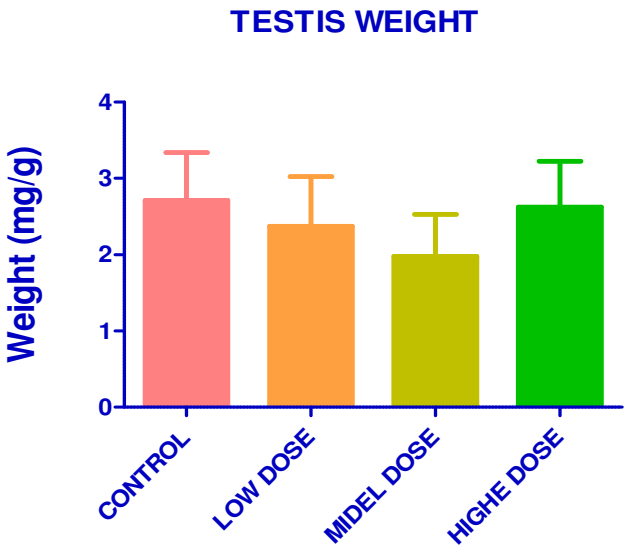
LOW DOSE
MIDEL DOSE
HIGHE DOSE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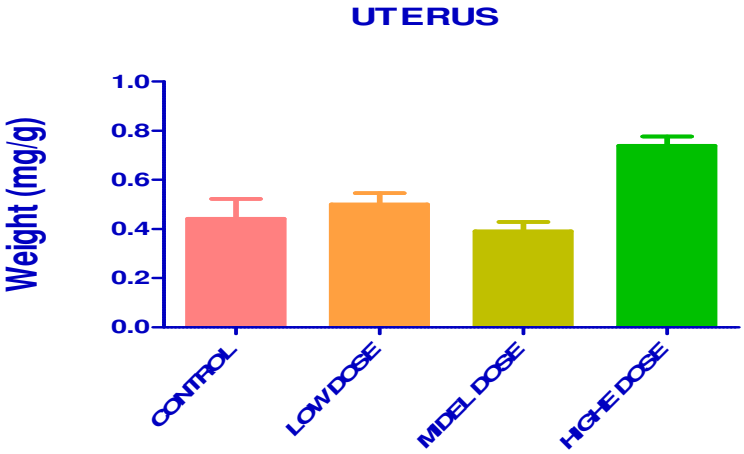
LOW DOSE
MIDEL DOSE
HIGHE DOSE


UTERUS
Weight (mg/g)
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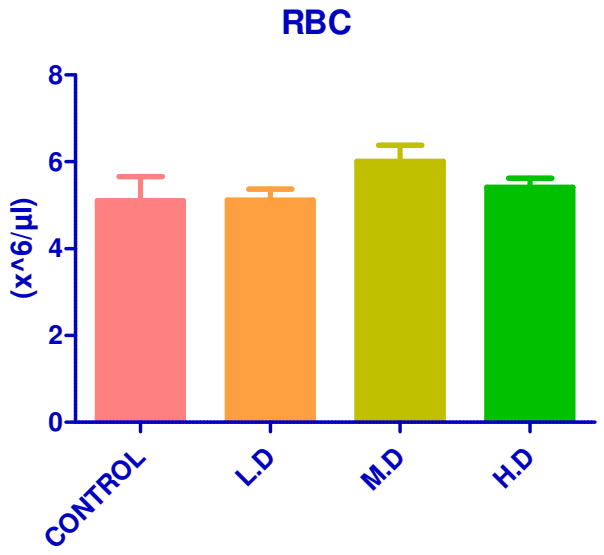
0.4
0.2
0.0
CONTROL
LOW DOSE
MIDEL DOSE
HIGHE DOSE

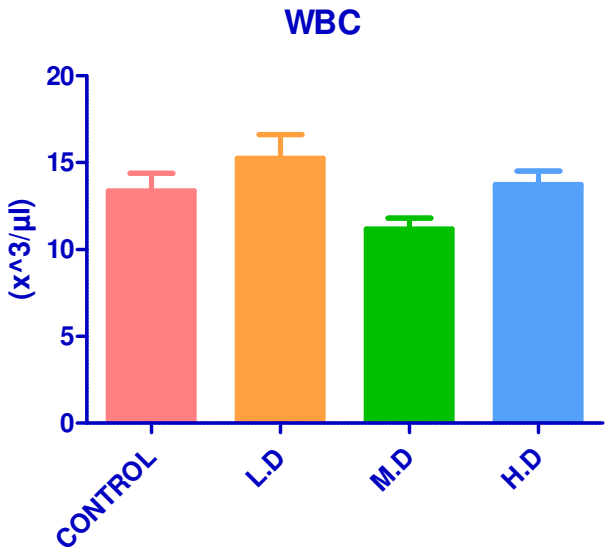
EFFECT OF SUB ACUTE DOSES (28 DAY) 0F KANDATHIRI LEGIYAM WITH GHEE AND PALM JAGGERY ON HAEMATOLOGICAL PARAMETERS

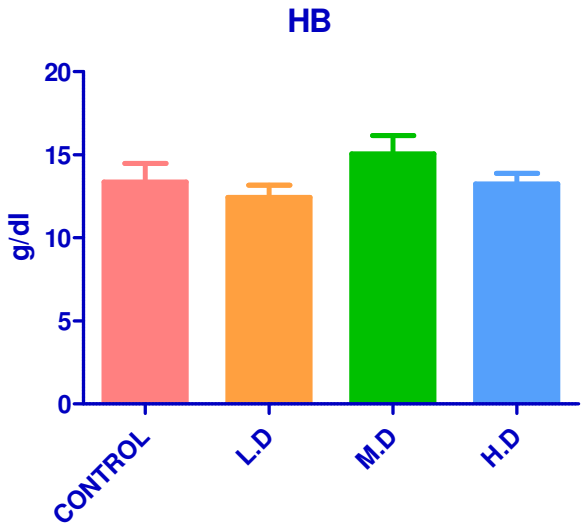
Effect Of Sub Acute Doses (28 Day) 0f KANDATHIRI LEGIYAM WITH GHEE AND PALM JAGGERY On Haematological Parameters

GROUP	Normal	L.D	M.D	H.D
RBC (X10^6/µL)	5.107±0.5573	5.127±0.2404	6.02±0.3635	5.417±0.2087
WBC(X10^3/µL)	13.37±1.027	15.27±1.362	11.17±0.636	13.73±0.786
HB (g/dl)	13.37±1.12	12.43±0.7446	15.07±1.091	13.27±0.6227

Values arae expressed as mean ± SEM Statistical significance (p) calculated by one way ANOVA followed by dunnett's (n=6); $^{ns}p>0.05$, *p<0.05, **p<0.01, ***p<0.001, calculated by comparing treated groups with control group.



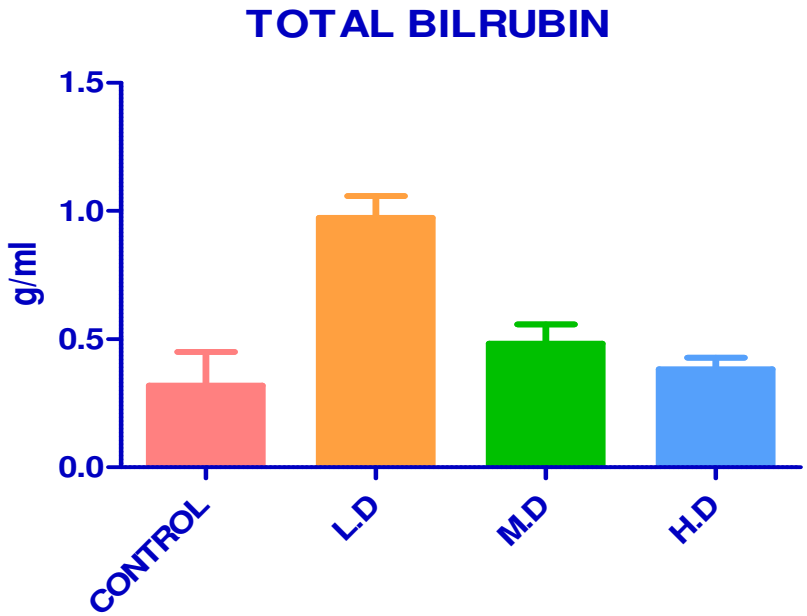




EFFECT OF SUB ACUTE DOSES (28 DAY) 0F KANDATHIRI LEGIYAM WITH GHEE AND PALM JAGGERY ON BIOCHEMICAL PARAMETER (LIVER PROFILE)

GROUP	Normal	L.D	M.D	H.D
TOTAL BILURBIN (g/ml)	0.32±0.1311	0.9733±0.08511	0.4833±0.07446	0.3833±0.04485

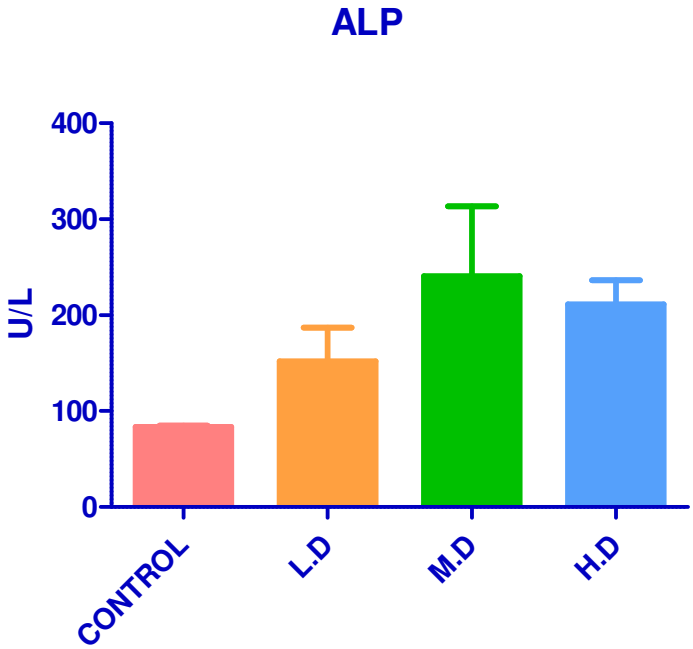
Values arae expressed as mean ± SEM Statistical significance (p) calculated by one way ANOVA followed by dunnett's (n=6); $^{ns}p>0.05$, *p<0.05, **p<0.01, ***p<0.001, calculated by comparing treated groups with control group.

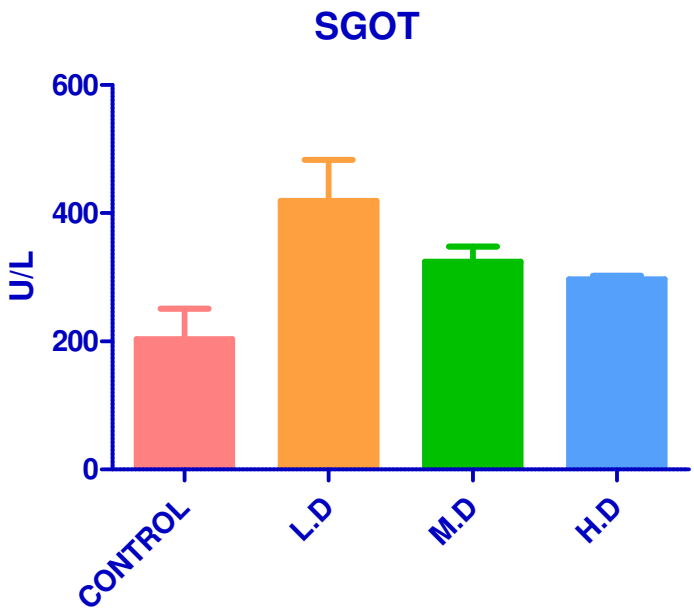


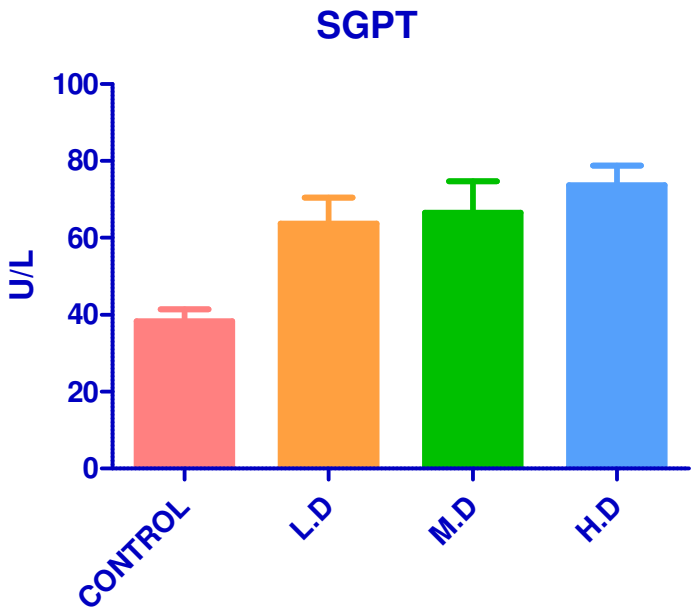
EFFECT OF SUB ACUTE DOSES (28 DAY) 0F KANDATHIRI LEGIYAM WITH GHEE AND PALM JAGGERY ON BIOCHEMICAL PARAMETER (LIVER PROFILE)

GROUP	Normal	L.D	M.D	H.D
SGOT (U/L)	203.8±47.31	419.1±63.96**	324±23.75	297.2±5.067
SGPT (U/L)	38.33±3.139	63.67±6.822*	66.57±8.175*	73.7±5.133**
ALP (U/L)	83.47±1.438	151.9±35.35	240.9±72.47*	211.6±24.75

Values arae expressed as mean ± SEM Statistical significance (p) calculated by one way ANOVA followed by dunnett's (n=6); ^{ns}p>0.05, *p<0.05, **p<0.01, ***p<0.001, calculated by comparing treated groups with control group.



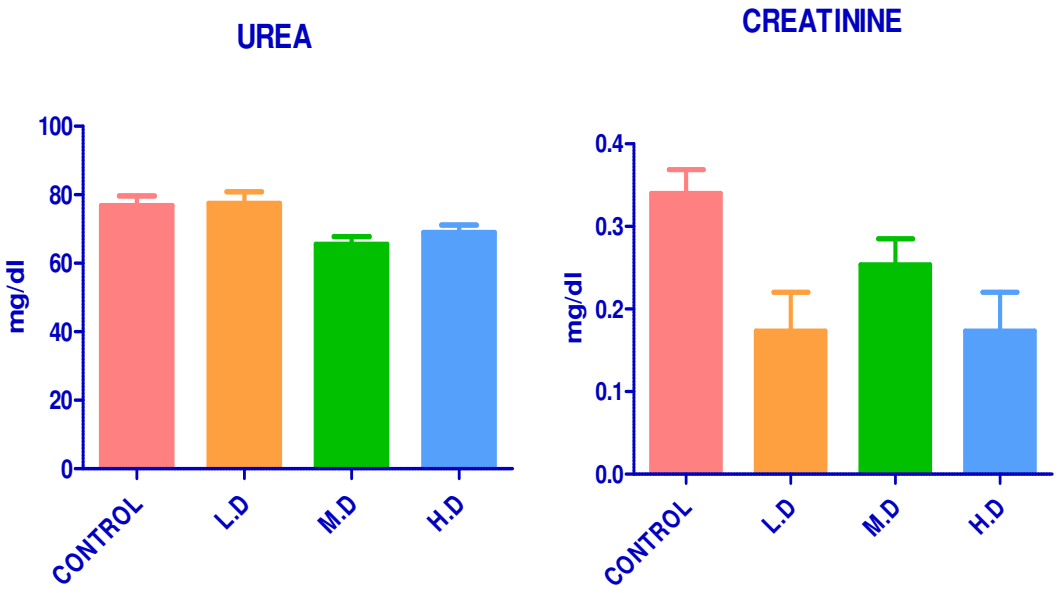

SGOT
600
400
200
0
U/L
CONTROL
L.D
M.D
H.D


SGPT
100
80
60
40
20
0
U/L
CONTROL
L.D
M.D
H.D

EFFECT OF SUB ACUTE DOSES (28 DAY) 0F KANDATHIRI LEGIYAM WITH GHEE AND PALM JAGGERY ON BIOCHEMICAL PARAMETER (KIDNEY PROFILE)

GROUP	Normal	L.D	M.D	H.D
UREA (mg/dl)	76.9±2.787	77.5±3.404	65.67±2.146	69.03±2.149
CREATININE (mg/dl)	0.34±0.02887	0.1733±0.04667	0.2533±0.0318	0.1733±0.04667

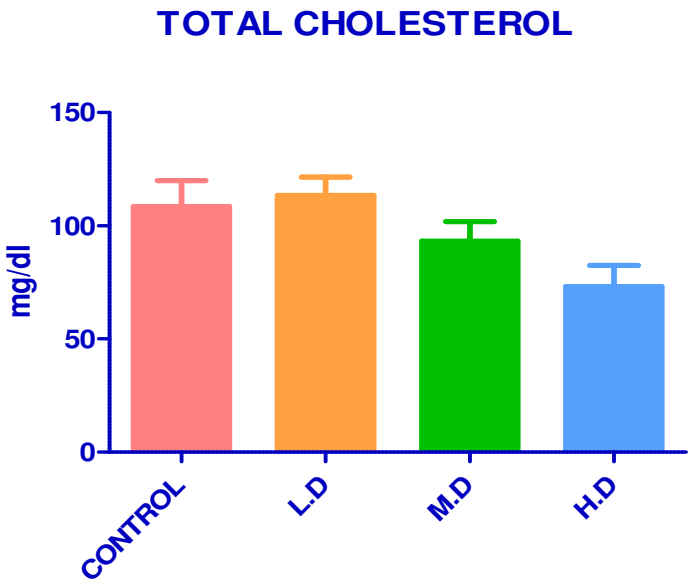
Values arae expressed as mean ± SEM Statistical significance (p) calculated by one way ANOVA followed by dunnett's (n=6); $^{ns}p>0.05$, *p<0.05, **p<0.01, ***p<0.001, calculated by comparing treated groups with control group.

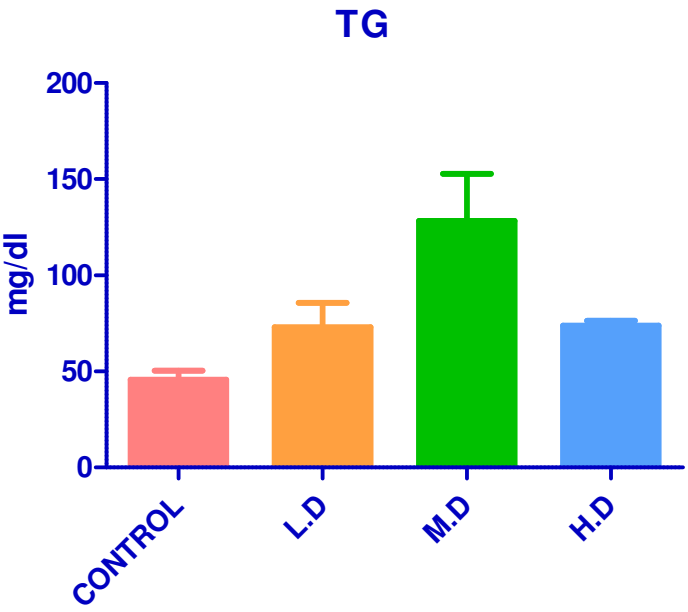


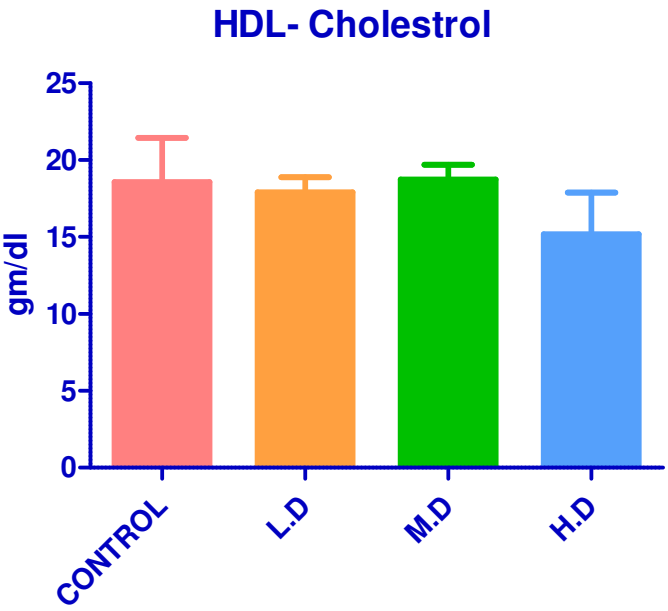
EFFECT OF SUB ACUTE DOSES (28 DAY) 0F KANDATHIRI LEGIYAM WITH GHEE AND PALM JAGGERY ON BIOCHEMICAL PARAMETER (LIPID PROFILE)

GROUP	Normal	L.D	M.D	H.D
Total cholesterol (mg/dl)	108.5±11.43	113.5±8.083	93.2±8.67	73.17±9.332
TG (mg/dl)	45.73±4.638	73.13±12.68	128.2±24.51	73.97±2.385
HDL (mg/dl)	18.57±2.881	17.9±0.9849	16.67±2.934	18.73±0.9615

Values arae expressed as mean ± SEM Statistical significance (p) calculated by one way ANOVA followed by dunnett's (n=6); $^{ns}p>0.05$, *p<0.05, **p<0.01, ***p<0.001, calculated by comparing treated groups with control group.




TG
200
150
100
50
0
mg/dl
CONTROL
L.D
M.D
H.D


HDL- Cholestrol
25
20
15
10
5
0
gm/dl
CONTROL
L.D
M.D
H.D

RESULTS:

CLINICAL SIGNS:

All animals in this study were free of toxic clinical signs throughout the dosing period of 28 days.

Mortality:

All animals in control and in all the treated dose groups survived throughout the dosing period of 28 days.

Body weight:

Results of body weight determination of animals Table-1 from control and different dose groups exhibited comparable body weight gain throughout the dosing period of 28 days.

Food consumption:

During dosing and the post-dosing recovery period, the quantity of food consumed by animals from different dose groups was found to be comparable with that by control animals.

Organ Weight:

Group Mean Relative Organ Weights (% of body weight) are recorded in Table No.4 Comparison of organ weights of treated animals with respective control animals on day 29 was found to be comparable similarly.

Hematological investigations:

The results of hematological investigations (Table 4) conducted on day 29 revealed following significant changes in the values of different parameters investigated when compared with those of respective controls; however, the increase or decrease in the values obtained was within normal biological and laboratory limits or the effect was not dose dependent.

Biochemical Investigations:

Results of Biochemical investigations conducted on days 29 and recorded in Table 2 revealed the following significant changes in the values of hepatic serum enzymes studied. When compared with those of respective control. However, the increase or decrease in the values obtained was within normal biological and laboratory limits.

Histopathology:

In histopathological examination, revealed normal architecture in comparison with control and treated animal.

DISCUSSION:

1) All the animals from control and all the treated dose groups up to 500 mg/kg survived throughout the dosing period of 28 days.

2) No signs of toxicity were observed in animals from different dose groups during the dosing period of 28 days.

3) Animals from all the treated dose groups exhibited comparable body weight gain with that of controls throughout the dosing period of 28 days.

4) Food consumption of control and treated animals was found to be comparable throughout the dosing period of 28 days

5) Haematological analysis conducted at the end of the dosing period on day 29, revealed no abnormalities attributable to the treatment.

6) Biochemical analysis conducted at the end of the dosing period on day 29 no abnormalities attributable to the treatment.

7) Organ weight data of animals sacrificed at the end of the dosing period was found to be comparable with that of respective controls.

8) Histopathological examination revealed normal architecture in comparison with control and treated animal.

SUMMARY AND CONCLUSION:

In conclusion **KANDATHIRI LEGIYAM WITH GHEE AND PALM JAGGERY** can be considered safe, as it did not cause either any lethality or adverse changes with general behavior of rats and also there were no observable detrimental effects (100 to 300 mg/kg body weight) over a period of 28 days. Our results have demonstrated that the **KANDATHIRI LEGIYAM WITH GHEE AND PALM JAGGERY** is relatively safe when administered orally in rats.

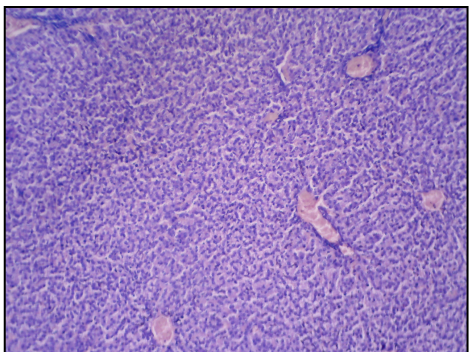
9.0 ABBRVIATION

No.	Number
Mg	Milligram
Kg	Kilogram
LD_{50}	Lethal Dose $_{50}$
p.o.	peros
mL	Milliliter
%	percentage
R&D	Research and Development

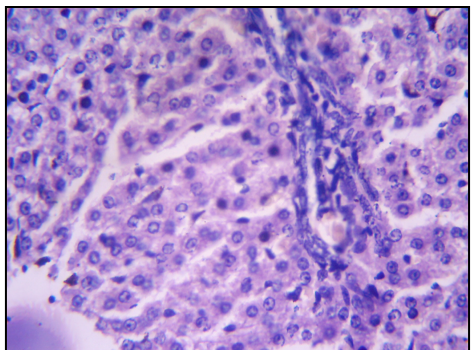
EDTA	Ethylene Diamine Tetra Acetic Acid
M	Male
g%	Gram percentage
g	Gram
NOAEL	No-Observed-Adverse-Effect-Level
MLD	Minimum Lethal Dose
MTD	Maximum Tolerated Dose
OECD	Organisation of Economic Co-operation and Development
CPCSEA	Committee for the Purpose of Control and Supervision of Experiments on Animals

HISTOPATHOLOGY - TOXICITY STUDY

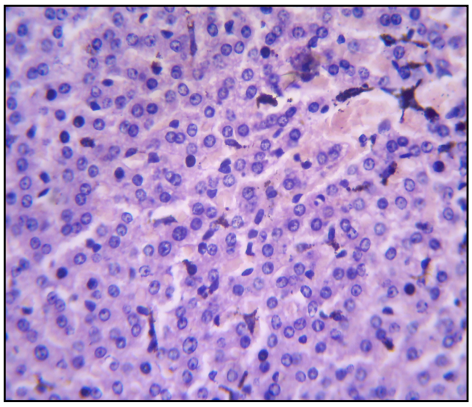
SPECIMEN : A) Liver. Group – : KANDATHIRI LEGHIYAM .



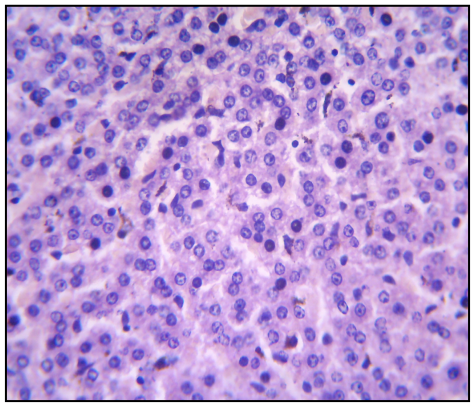
10x shows mild altered lobular architecture



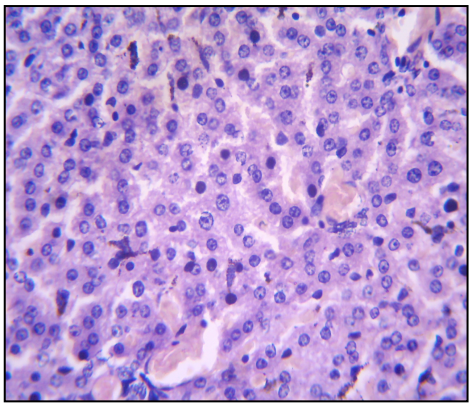
40x shows bile duct hyperplasia



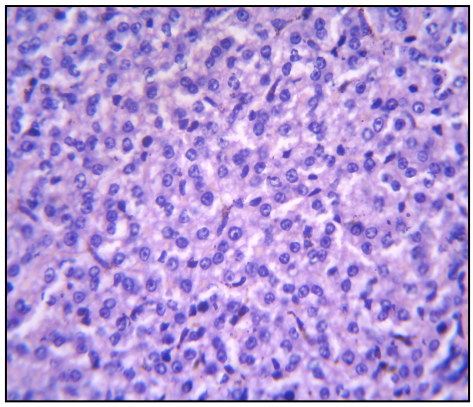
40x shows central vein congestion



40x shows kupffer cell hyperplasia



40x shows kupffer cell



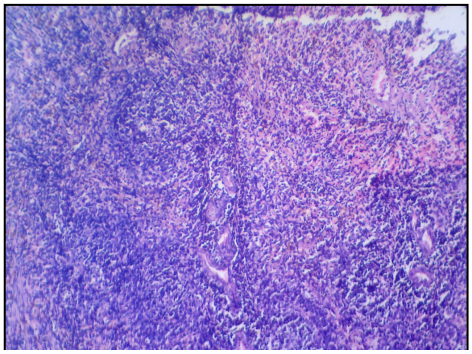
40x shows normal hepatocytes

MICROSCOPIC APPEARANCE:

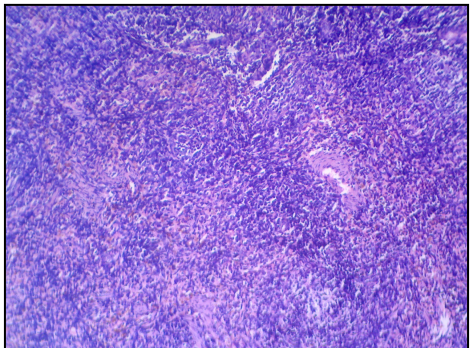
Section from liver shows lobular architecture with interface hepatitis. Individual Hepatocytes shows reactive atypia. Portal triad shows no significant pathology. Central vein and Sinusoids show dilatation.

SPECIMEN : B) spleen.

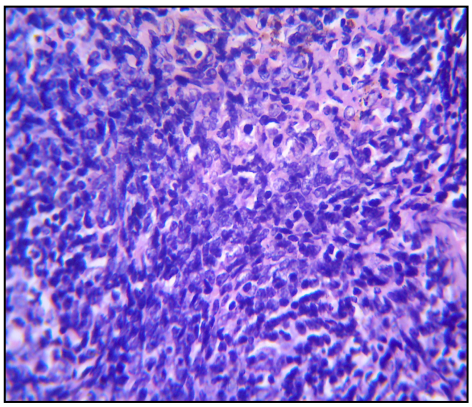
Group – : KANDATHIRI LEGHIYAM



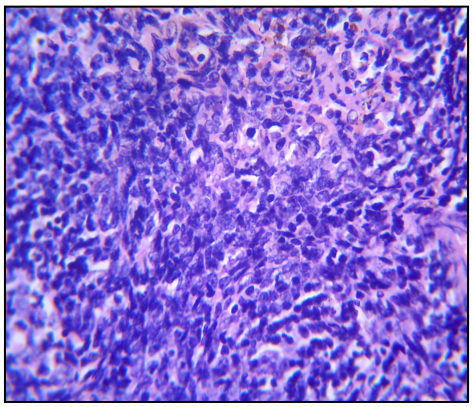
10x shows normal red pulp and white pulp



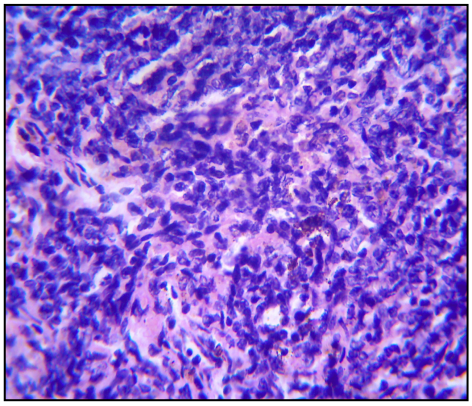
10x shows normal spleen



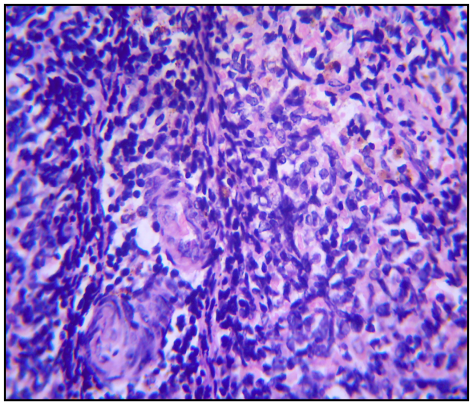
40x shows lymphocytic infiltration (2)



40x shows lymphocytic infiltration



40x shows lymphocytic infiltrtion



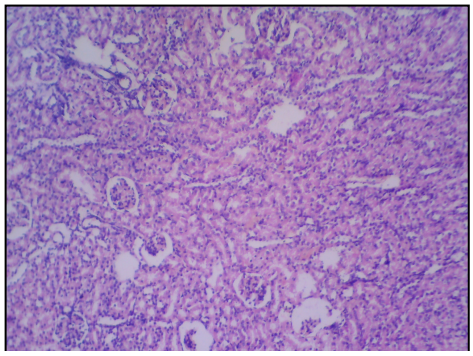
40x shows red pulp and white pulp with pencillar artery

MICROSCOPIC APPEARANCE:

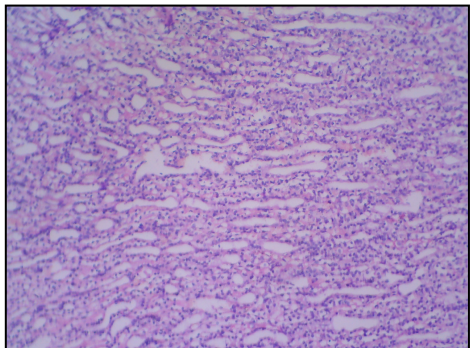
Section studied from spleen shows normal white pulp and red pulp. Red pulp shows pigment laden macrophages and congested vessels. White pulp shows lymphocytic infiltrates forming germinal centre. The pencillar artery shows normal morphology. Megakaryocytes

SPECIMEN : C) Kidney.

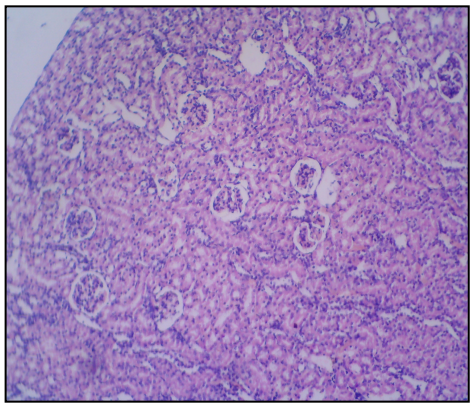
Group – : KANDATHIRI LEGHIYAM



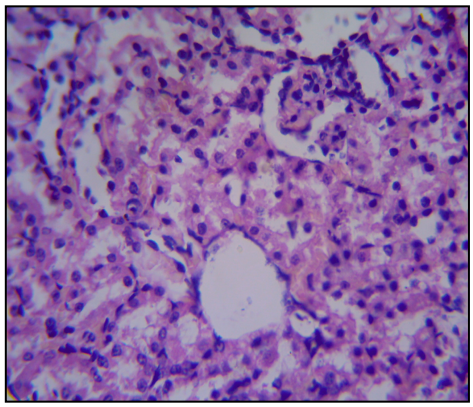
10x shows normal kidney



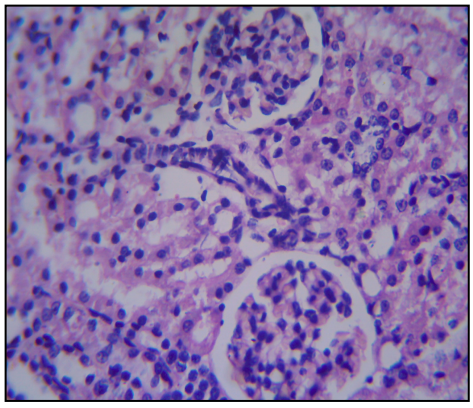
10x shows normal interstitium



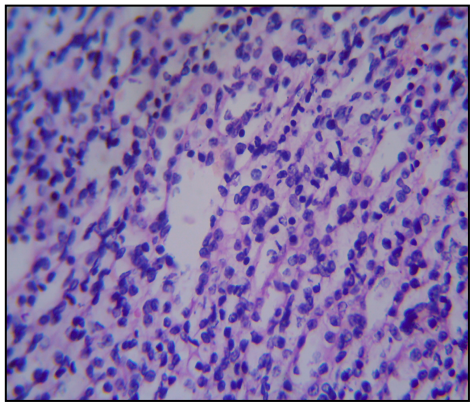
10x shows segmental glomerulo nephritis



40x shows focal segmental nephritis



40x shows glomeruli



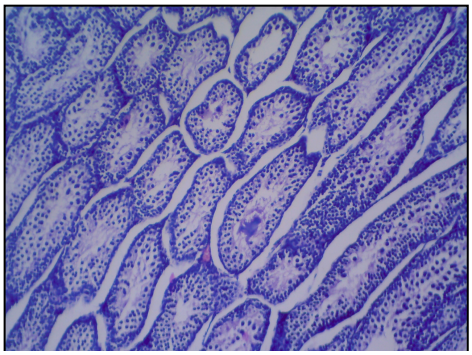
40x shows mild lymphocytic infiltration

MICROSCOPIC APPEARANCE:

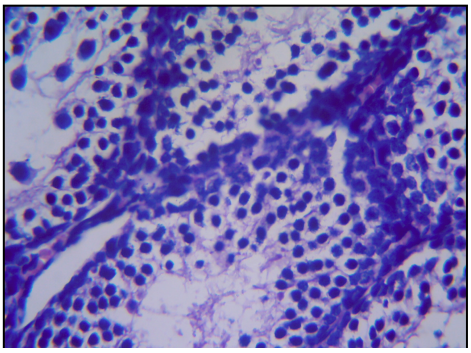
Section from kidney shows both cortex and medulla. Glomeruli and tubules shows no significant pathology. Interstitium shows no significant pathology. Blood vessels show congestion. There is no evidence of toxic changes.

SPECIMEN : D) Testis

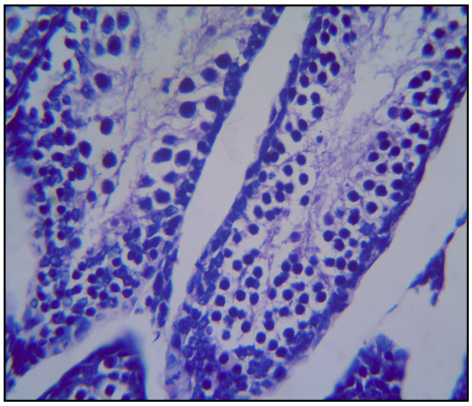
Group – : KANDATHIRI LEGHIYAM



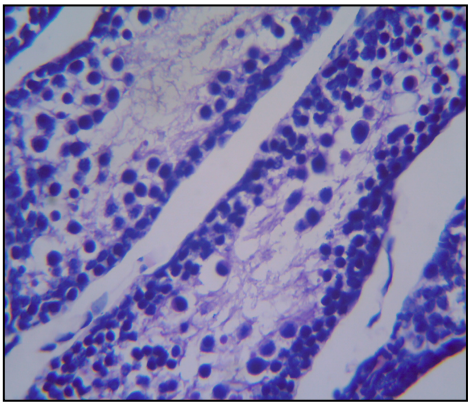
10x shows normal seminiferous tubules



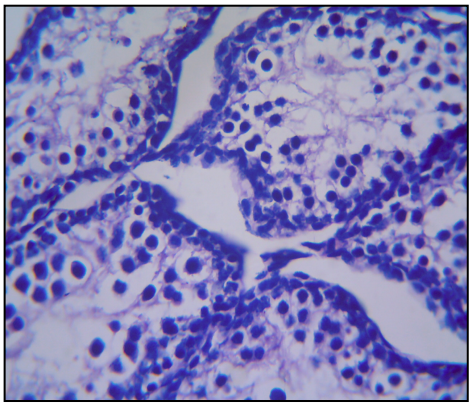
40x shows normal maturation



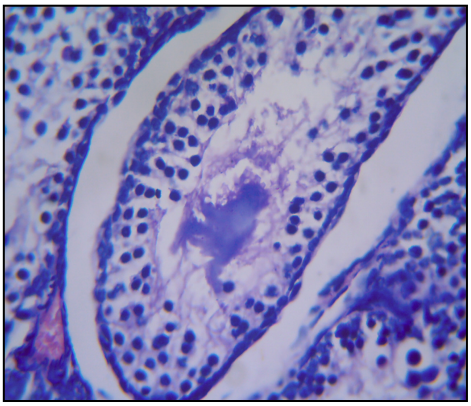
40x shows normal spermatogenesis



40x shows spermatogenesis



40x shows tubules with normal maturation



40x shows tubules

MICROSCOPIC APPEARANCE:

Section from testes with seminiferous tubules showing maturation arrest with lacking of spermatogenesis.

Name : **Ref. No. : [H0 329A/18]**	**Rec.On : 21/03/2018** **Rep.On : 18/04/2018**

HISTOPATHOLOGY

TOXICITY STUDY

SPECIMEN : A) Liver

Group – : Vigneshwari- K.L.

GROSS APPEARANCE:

Received a specimen of liver measuring 3.4x2.3x1.2cms.

(PE): Two bits – One block.

MICROSCOPIC APPEARANCE:

Section from liver shows mild altered lobular architecture with kupffer cell hyperplasia. Individual Hepatocytes shows no pathology. Portal triad shows bile duct hyperplasia. Central vein shows congestion. Sinusoids show dilatation.

Dr.C.R.Ajeethkumar.M.D. (Path).

Consultant pathologists:
Dr.S.Kalyani.M.D. (Path), Dr. C.R.Ajeeth kumar.M.D. (Path),

Checked

Name : **Ref. No. : [H0 329B/17]**	**Rec.On : 21/03/2018** **Rep.On : 18/04/2018**

HISTOPATHOLOGY

Toxicity study

SPECIMEN : B) Spleen.

Group – : Vigneshwari- K.L.

GROSS APPEARANCE:

Received a specimen of spleen measuring 2.0x0.8x0.4cms.

(PE): Two bits – One block.

MICROSCOPIC APPEARANCE:

Section studied from spleen shows normal white pulp and red pulp. Red pulp shows pigment laden macrophages and congested vessels. White pulp shows lymphocytic infiltrates forming germinal centre. The pencillar artery shows normal morphology. There is no evidence of toxic changes.

Dr.C.R.Ajeeth kumar. M.D. (Path),

Consultant pathologists:
Dr.S.Kalyani.M.D. (Path), Dr. C.R.Ajeeth kumar.M.D. (Path),

Checked

Name : **Ref. No. : [Ho 329C/18]**	**Rec.On : 21/03/2018** **Rep.On : 18/04/2018**

HISTOPATHOLOGY

Toxicity study

SPECIMEN : **C)Kidney.**

Group – : Vigneshwari- K.L .

GROSS APPEARANCE :

Received specimen of kidneys each measuring 1.3x0.6x0.5cms and 1.2x0.5x0.5cms.

PE : Two bits – One block.

MICROSCOPIC APPEARANCE:

Section from kidney shows both cortex and medulla. Glomeruli shows focal segmental glomerulonephritis(less than 50%) (mesangeal matrix expansion and hypercellularity). Tubules shows no significant pathology. Interstitium shows scattered lymphocytic infiltrates. Blood vessels show congestion.

Dr. C.R.Ajeeth kumar.M.D. (Path).

Consultant pathologists:
Dr.S.Kalyani.M.D. (Path), Dr. C.R.Ajeeth kumar.M.D. (Path),

Checked

Name : **Ref. No. : [Ho 329D/18]**	**Rec.On : 21/03/2018** **Rep.On : 18/04/2018**

HISTOPATHOLOGY

Toxicity study

SPECIMEN : **D)Testis.**

Group – : Vigneshwari- K.L.

GROSS APPEARANCE :

Received specimen of both testis measuring each 1.2x0.6x0.5cms and 1.1x0.5x0.4cms.

PE : Two bits – One block.

MICROSCOPIC APPEARANCE:

Section from testes with seminiferous tubules showing normal spermatogenesis. Sertoli cells and interstitium shows normal morphology. No evidence of toxic changes.

Dr. C.R.Ajeeth kumar.M.D. (Path).

Consultant pathologists:
Dr.S.Kalyani.M.D. (Path), Dr. C.R.Ajeeth kumar.M.D. (Path),

GOVERNMENT SIDDHA MEDICAL COLLEGE & HOSPITAL

POST GRADUATE DEPARTMENT

PALAYAMKOTTAI, TIRUNELVELI – 627002

BRANCH – III SIRAPPU MARUTHUVAM

AN OPEN CLINICAL TRIAL OF **KANDATHRI LEGIYAM**(INTERNAL) & **NAKKA PUSA MUKUTTENNAI** (EXTERNAL) FOR **AZHAL KELL VAYU** (OSTEOARTHRITIS)

FORM I – SCREENING & SELECTION PROFORMA

1. OP / IP NO : _____
2. NAME : _____
3. RELIGION : H / C / M / O
4. AGE / GENDER : _____
5. OCCUPATION : _____
6. INCOME : _____
7. CONTACT NO : _____
8. INCLUSION CRITERIA :

Inclusion criteria

- Age : 30 – 60 yrs
- Sex : Both Male and Female
- Patients having symptoms of joint pain in one or both knee joints, swelling, tenderness, stiffness, crepitation, restricted movements of joints.
- Patients who are willing to give blood samples for laboratory investigation.
- Patients who are willing to take radiological imaging before and after treatment.
- Patients who are willing to participate in this study with the knowledge of potential risks.

Exclusion criteria

- Cardiac disease
- Rheumatoid arthritis
- Use of narcotic drugs
- Pregnancy and lactation
- History of trauma
- Carcinoma patient
- Other Systemic Illness
- Tuberculosis
- Immuno compromised patient
- Clinically significant abnormal laboratory values.

ADMITTED TO TRIAL:

YES NO

If Yes Serial Number:

Date :

Station:

Signature of the Investigator :

Signature of the Lecturer : **Signature of the HOD**

GOVERNMENT SIDDHA MEDICAL COLLEGE & HOSPITAL

POST GRADUATE DEPARTMENT

PALAYAMKOTTAI, TIRUNELVELI – 627002

BRANCH – III SIRAPPU MARUTHUVAM

AN OPEN CLINICAL TRIAL OF **KANDATHRI LEGIYAM**(INTERNAL) & **NAKKA PUSA MUKUTTENNAI** (EXTERNAL) FOR **AZHAL KELL VAYU** (OSTEOARTHRITIS)

FORM I A – HISTORY PROFORMA

1. SL.NO : _____
2. OP / IP NO : _____
3. NAME : _____
4. RELIGION : H / C / M / O
5. AGE / GENDER : _____
6. OCCUPATION : _____
7. INCOME : _____
8. CONTACT NUMBER : _____
9. MARITAL STATUS : Married / Unmarried
10. COMPLAINTS & DURATION :

11. PERSONAL HISTORY:

PERSONAL HABITS	YES	NO	IF YES SPECIFY DURATION
Smoking			
Tobacco Chewing			
Alcohol			
Narcotic Drug Addiction			

12. DRUG HISTORY:

Whether the Patient has underwent any allopathic Treatment

1. Yes 2. No.

If yes specify the nature of the drug and treatment duration _____

13. FAMILY HISTORY:

Whether this problem runs in family?

1. Yes 2. No

If yes, mention the relationship of affected person(s)

1. _____
2. _____

14. DIETARY HABITS :

1. Pure vegetarian ☐
2. Non-Vegetarian ☐

Date :

Station:

Signature of the Investigator :

Signature of the Lecturer : **Signature of the HOD**

GOVERNMENT SIDDHA MEDICAL COLLEGE & HOSPITAL

POST GRADUATE DEPARTMENT

PALAYAMKOTTAI, TIRUNELVELI – 627002

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FORM II AND II-A CLINICAL ASSESSMENT ON ENROLLMENT AND ON VISITS

1.	OP / IP No	:
2.	BED No	:
3.	SL. NO	:
4.	NAME	:
5.	AGE	:
6.	GENDER	:
7.	OCCUPATION	:
8.	SOCIAL STATUS	:
9.	DATE OF ADMISSION	:
10.	DATE OF DISCHARGE	:
11.	POSTAL ADDRESS	:
12.	COMPLAINTS & DURATION	:
13.	HISTORY OF PRESENT ILLNESS	:
14.	PAST HISTORY	:
15.	FAMILY HISTORY	:

16. MENSTRUAL HISTORY (If Applicable):

17. HABITS:

1. Smoker :
2. Alcoholic :
3. Tobbaco chewer :
4. Betel nut chewer :
5. Non-Vegetarian :
6. Drug addiction :

18. GENERAL EXAMINATION:

1. Body weight (Kg) :
2. Height (Cm) :
3. Body Temperature (F) :
4. Blood Pressure (mmHg) :
5. Pulse Rate (/min) :
6. Heart Rate (/min) :
7. Respiratory Rate (/min) :
8. Pallor :
9. Jaundice :
10. Clubbing :
11. Cyanosis :
12. Pedal Oedema :
13. Lymphadenopathy :
14. Jugular venous pulsation :

19. CLINICAL EXAMINATION:

I. INSPECTION:

1. Attitude :
2. Muscular spasm :
3. Muscle wasting – Proximal :
4. Muscle wasting – Distal :
5. Minor Joint Swelling :
6. Major Joint Swelling :
7. Nodules :
8. Deformity :

II. PALPATION:

1. Swelling :
2. Tenderness :
3. Joint Stiffness :
4. Muscle wasting :
5. Local heat :
6. Local Lymphadenopathy :
7. Pitting Oedema :
8. Nodules :

III. MOVEMENTS:

Restriction of joint movements

1.	Neck	:	Full	Partial
2.	Shoulder	:		
3.	Elbow joint	:		
4.	Knee joint	:		
5.	Ankle joint	:		
6.	Hip joint	:		
7.	Minor joints	:		

IV. PAIN:

1.	Onset :	Sudden	:	Gradual	:	
2.	Early morning stiffness :	Present	:	absent	:	
3.	Nature of pain:	Mild	:	Moderate	:	Severe:
4.	Aggravating factor –Movements		:			
5.	Relieving factor – rest		:			
6.	Stiffness		:			
7.	Tenderness		:			

V. CLINICAL ASSESSMENT :

1. Arthritis of three or more Joints :
2. Arthritis of hand joints :
3. Morning Stiffness :
4. Fever :
5. Anorexia :
6. Anaemia :
7. Spindle appearance of fingers :
8. Restricted movements :
9. Rheumatoid Nodules :
10. Numbness :

20. EXAMINATION OF OTHER SYSTEMS:

1. CVS :
2. RS :
3. CNS :
4. ABDOMEN :
5. GENITO – URINARY :

EXAMINATION – SIDDHA ASPECTS

1. NILAM:

1. Kurinji 2. Mullai 3. Marutham 4. Neithal 5. Paalai

2. KAALAM:

1. Kaar Kaalam 2. Koothir Kaalam 3. Munpani Kaalam
4. Pinpani Kaalam 5. Elavenir Kaalam 6. Mudhuvenir Kaalam

3. YAAKKAI:

1. Vatham 2. Pitham 3. Kabam
4. Vathapitham 5. Pithavatham 6. Kabavatham
7. Vathakabam 8. Pithakabam 9. Kabapitham

4. GUNAM:

1. Sathuvam 2. Rasatham 3. Thamasam

5. KANMENDHIRIUM / KANMAVIDAYAM

1. Kai :
2. Kaal :

3. Vaai :

4. Eruvaai :

5. Karuvaai :

6. UYIR THATHUKKAL:

I. VATHAM:

1. Piraanan :
2. Abaanan :
3. Viyaanan :
4. Uthaanan :
5. Samaanan :
6. Naagan :
7. Koorman :
8. Kirukaran :
9. Devathathan :
10. Dhananjeyan :

II. PITHAM :

1. Analagam :
2. Ranjagam :
3. Saathagam :
4. Aalosagam :
5. Praasagam :

III. KABAM:

1. Avalambagam :
2. Kilethagam :
3. Pothagam :
4. Tharpagam :
5. Santhigam :

7. UDAL THAATHUKKAL:

1. Saaram :
2. Senneer :
3. Oon :
4. Kozhuppu :
5. Enbu :

6. Moolai :
7. Sukkilam / Suronitham:

8. ENVAGAI THERVUGAL:

1. Naadi :
2. Sparisam :
3. Naa :
4. Niram :
5. Mozhi :
6. Vizhi :
7. Malam :

   i. Niram: ii. Thanmai: iii. Irugal: iv.Ilagal:

8. Moothiram :

I. NEERKURI:

a. Niram :
b. Manam :
c. Edai :
d. Nurai :
e. Enjal :

II. NEIKURI:

Vatha Neer : Pittha Neer : Kaba Neer :

Date :
Station:
Signature of the Investigator :
Signature of the Lecturer : **Signature of the HOD**

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FORM III – LABORATORY INVESTIGATION

1. BLOOD:

   1. TC : (Cells / Cumm)
   2. DC (%) : N : L : M : E :
   3. ESR (mm) : ½ hr : 1 hr :
   4. Hb :
   5. Blood Sugar : a) Fasting : b) Post Prandial :
   6. Renal function tests:
      Blood Urea: Serum creatinine:
   7. Lipid profile :
      HDL: LDL: VLDL:
      Total Cholesterol : TGL :
   8. Liver Function tests:
      Serum Bilirubin : Total Direct Indirect

SPECIFIC INVESTIGATIONS

RA factor :
ASO titre :
C-Reactive Protein :
SGOT :
SGPT :
Serum albumin & globulin :
Total protein :

II. URINE:

1. Albumin :
2. Sugar :
3. Epithelial cells :
4. Pus cells :
5. Red blood cells :
6. Casts / Crystals :

III. MOTION:

1. Ova :
2. Cyst :
3. Occult blood :

4. Pus cells :

IV. X-RAY FINDINGS

Date :

Station:

Signature of the Investigator :

Signature of the Lecturer : **Signature of the HOD**

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POST GRADUATE DEPARTMENT

PALAYAMKOTTAI, TIRUNELVELI – 627002

BRANCH – III SIRAPPU MARUTHUVAM

FORM IV A – CONSENT FORM

AN OPEN CLINICAL TRIAL OF **KANDATHRI LEGIYAM**(INTERNAL) & **NAKKA PUSA MUKUTTENNAI** (EXTERNAL) FOR **AZHAL KELL VAYU** (OSTEOARTHRITIS)

CERTIFICATE BY INVESTIGATOR

I certify that I have disclosed all the details about the study in the terms readily understood by the patient.

Signature _____

Date _____

Name _____

CONSENT BY PATIENT

I have been informed to my satisfaction, by the attending physician, the purpose of the clinical trial, and the nature of drug treatment and follow-up including the laboratory investigations to be performed to monitor and safeguard my body functions.

I am aware of my right to opt out of the trial at any time during the course of the trial without having to give the reasons for doing so.

I exercising my free power of choice, hereby give my consent to be included as a subject in the clinical trial of "SARVANGA VATHA CHOORANAM" (Internal drug) and "KETHAKI THYLAM" (External drug) for the treatment of "AZHAL KEEL VAYU" (OSTEOARTHRITIS)".

Place :

Date :

Signature :

Name :

Witness Signature:

Name :

அரசினர் சித்த மருத்துவக் கல்லூரி மற்றும் மருத்துவமனை

பாளையங்கோட்டை

பட்டமேற்படிப்பு சிறப்பு மருத்துவத்துறை

"கண்டாத்திரி இலேகியம் " மற்றும் "நக்க பூச முக்கூட்டெண்ணெய்"இவற்றின் பரிகரிப்புத் திறனைக் கண்டறியும் மருத்துவ ஆய்வு ஒப்புதல் படிவம் ஆய்வாளரால் சான்றளிக்கப்பட்டது.

நான் இந்த ஆய்வைக் குறித்த அனைத்து விபரங்களையும் நோயாளிக்கு புரியும் வகையில் எடுத்துரைத்தேன் என உறுதியளிக்கிறேன்.

தேதி : கையொப்பம்:

இடம் : பெயர்:

நோயாளியின் ஒப்புதல்

என்னிடம் இந்த மருத்துவ ஆய்வின் காரணத்தையும் மருந்தின் தன்மை மற்றும் மருத்துவ வழிமுறையைப் பற்றியும் தொடர்ந்து எனது உடல் இயக்கத்தை கண்காணிக்கவும், அதனைப் பாதுகாக்கவும் பயன்படும் மருத்துவ ஆய்வுக்கூட பரிசோதனைகள் பற்றியும் திருப்தி அளிக்கும் வகையில் ஆய்வு மருத்துவரால் விளக்கிக் கூறப்பட்டது.

நான் இந்த மருத்துவ ஆய்வின் போது காரணம் எதுவும் கூறாமல் எப்பொழுது வேண்டுமானாலும் இந்த ஆய்விலிருந்து என்னை விடுவித்துக் கொள்ளும் உரிமையை தெரிந்திருக்கின்றேன்.

நான் என்னுடைய சுதந்திரமாகத் தேர்வு செய்யும் உரிமையைக் கொண்டு **அழல் கீல் வாயு** என்னும் நோய்க்கான **"கண்டாத்திரி இலேகியம்"** மற்றும் **"நக்க பூச முக்கூட்டெண்ணெய்"** ஆகியவற்றின் பரிகரிப்புத் திறனைக் கண்டறியும் மருத்துவ ஆய்விற்கு என்னை உட்படுத்த ஒப்புதல் அளிக்கிறேன்.

தேதி : கையொப்பம்:

இடம் : பெயர் :

சாட்சிக்காரர் கையொப்பம்:

பெயர் :

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POST GRADUATE DEPARTMENT

PALAYAMKOTTAI, TIRUNELVELI – 627002

BRANCH – III SIRAPPU MARUTHUVAM

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FORM IV B WITHDRAWL FORM

1. SL.NO : _____
2. OP / IP NO : _____
3. NAME : _____
4. RELIGION : H / C / M / O
5. AGE / GENDER : _____
6. OCCUPATION : _____
7. SOCIAL STATUS : _____
8. CONTACT NO : _____
9. DATE OF TRIAL COMMENCEMENT : _____
10. DATE OF WITHDRAWAL FROM TRIAL : _____
11. REASONS FOR WITHDRAWAL : _____

- Long absence at reporting : Yes / No
- Irregular treatment : Yes / No
- Shift of locality : Yes / No
- Increase in severity of symptoms : Yes / No
- Development of severe adverse drug reactions: Yes / No

Date :

Station:

Signature of the Investigator :

Signature of the Lecturer : **Signature of the HOD**

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PALAYAMKOTTAI, TIRUNELVELI – 627002

BRANCH – III (SIRAPPU MARUTHUVAM)

AN OPEN CLINICAL TRIAL OF **KANDATHRI LEGIYAM**(INTERNAL) & **NAKKA PUSA MUKUTTENNAI** (EXTERNAL) FOR **AZHAL KELL VAYU** (OSTEOARTHRITIS)

FORM IV – C DRUG COMPLIANCE FORM

Name of the Drug : **KANDATHRI LEGIYAM**

Drugs issued : (Mg / Gram)

Drugs returned : (Mg / Gram)

S. NO	**DATE**	**DRUG TAKEN TIME**	
		MORNING / TIME	**EVENING / TIME**
Day 1			
Day 2			
Day 3			
Day 4			
Day 5			
Day 6			
Day 7			
Day 13			
Day 14			
Day 15			
Day 16			
Day 17			
Day 18			
Day 19			
Day 25			
Day 26			
Day 27			
Day 28			

Day 29			
Day 30			
Day 31			
Day 37			
Day 38			
Day 39			
Day 40			
Day 41			
Day 42			
Day 43			
Day 44			
Day 45			
Day 46			
Day 47			
Day 48			

Date :

Station:

Signature of the Investigator :

Signature of the Lecturer : **Signature of the HOD**

BIBLIOGRAPHY

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- Sabapathi kaiyedu
- Agathiyar Gunavakadam
- Yugi Sinthamani
- Siddha Maruthuvanga Surukam
- Pararasasekaram
- Theraiyar Vagadam
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- Noi Naadal Noi Mudhal Naadal – Dr.P. Shanmugavelu
- Agathiyar Naadi
- Theraiyar Neer Kuri and Neikuri
- Gunapadam Mooligai Vaguppu by C.Murugesa Mudaliar
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URINE EXAMINATION BEFORE & AFTER TREATMENT – IN PATIENTS

S.no	Ip.no	Before treatment			After treatment		
		Albumin	Sugar	Deposit	Albumin	Sugar	Deposit
1	2004	NIL	NIL	NAD	NIL	NIL	NAD
2	2115	Trace	NIL	2-3 pus cells	Trace	NIL	NAD
3	2154	NIL	NIL	NAD	NIL	NIL	NAD
4	2942	NIL	NIL	NAD	NIL	NIL	NAD
5	3094	NIL	NIL	NAD	NIL	NIL	NAD
6	3285	NIL	NIL	NAD	NIL	NIL	NAD
7	3358	NIL	NIL	NAD	NIL	NIL	NAD
8	46	NIL	NIL	NAD	NIL	NIL	NAD
9	233	NIL	NIL	NAD	NIL	NIL	NAD
10	380	NIL	NIL	NAD	NIL	NIL	NAD
11	383	NIL	NIL	NAD	NIL	NIL	NAD
12	389	NIL	NIL	NAD	NIL	NIL	NAD
13	430	NIL	NIL	NAD	NIL	NIL	NAD
14	533	NIL	NIL	NAD	NIL	NIL	NAD
15	548	NIL	NIL	NAD	NIL	NIL	NAD
16	838	Trace	NIL	1-2 pus cells	NIL	NIL	NAD
17	1045	NIL	NIL	NAD	NIL	NIL	NAD
18	1073	NIL	NIL	NAD	NIL	NIL	NAD
19	1115	NIL	NIL	NAD	NIL	NIL	NAD
20	1194	NIL	NIL	NAD	NIL	NIL	NAD

LIST OF IN PATIENTS OF PG III SIRAPPU MARUTHUVAM DEPARTMENT GIVEN

1.KANDATHIRI LEGHIYAM – INTERNAL 2.NAKKA PUSA MUKOOTTENNAI – EXTERNAL

S.NO	IP.NO	NAME	AGE/SEX	OCCUPATION	DATE OF ADMISSION	DATE OF DISCHARGE	TOTAL NO. OF DAYS TREATED		TOTAL NO. OF DAYS	RESULT
							IP	OP		
1	2004	Ashwathi	52/f	House wife	11-07-17	16-08-17	37	11	48	MARKED
2	2115	Maharasi	55/f	House wife	25-07-17	29-08-17	36	12	48	MARKED
3	2154	Chendhura paundiyan	58/m	Farmer	30-07-17	16-08-17	17	31	48	MODERATE
4	2942	Poovaiya	55/m	Farmer	21-10-17	21-11-17	32	16	48	MARKED
5	3094	Velammal	51/f	House wife	20-11-17	18-12-17	29	19	48	MILD
6	3285	Sornam	59/f	House wife	15-12-17	09-01-18	26	22	48	MARKED
7	3358	Palaniyammal	60/f	House wife	27-12-17	10-02-18	46	2	48	MODERATE
8	46	Kaliyappan	52/m	Farmer	08-01-18	26-02-18	49	0	48	MARKED
9	233	Anuthai	52/f	House wife	30-01-18	14-03-18	46	2	48	MILD
10	380	Mariyammal	41/f	House wife	13-02-18	01-03-18	17	31	48	MARKED
11	383	Lakshmi	60/f	House wife	14-02-18	16-03-18	28	20	48	MODERATE
12	389	Pon selvi	48/f	House wife	14-02-18	16-03-18	28	20	48	MARKED
13	430	Nadarajan	60/m	Farmer	23-02-18	18-03-18	29	19	48	MILD
14	533	Ponnuthai	60/f	House wife	27-02-18	15-03-18	17	31	48	NO EFFECT
15	548	Anaikarai muthu	56/m	Farmer	28-02-18	29-03-18	30	18	48	MARKED
16	838	Vasugi	40/f	House wife	27-03-18	17-04-18	22	26	48	MARKED
17	1045	Annamalai	60/f	House wife	17-04-18	05-06-18	50	0	48	MARKED
18	1073	Pandiyaraj	33/m	Masson	19-04-18	22-05-18	34	14	48	MARKED
19	1115	Kuruvammal	60/f	House wife	24-04-18	29-07-18	35	13	48	MARKED
20	1194	Raja lakshmi	60/f	House wife	03-05-18	11-06-18	37	11	48	MARKED

CASE PRESENTATION – SUMMARY OF OUT PATIENTS

1. KANDATHIRI LEGHIYAM – INTERNAL 2.NAKKA PUSA MUKOOTTENNAI – EXTERNAL

S.no	Op.no	Name	Age/sex	Occupation	Date of registration	Date of completion of treatment	No. Of days treated	Result
1	110149	Navamani	59/m	Farmer	14-12-17	02-02-18	49	MODERATE
2	113318	Jeyanthi	43/f	House wife	23-12-17	02-02-18	42	MILD
3	114833	Valliyammal	48/f	House wife	28-12-17	16-02-18	48	MARKED
4	114059	Iyyam perumal	60/m	Farmer	29-12-17	02-02-18	35	MARKED
5	1759	Rasammal	50/f	House wife	04-01-18	20-02-18	48	MODERATE
6	5669	Kala	56/f	House wife	17-01-18	27-02-18	42	MARKED
7	5810	Jeyarani	52/f	Teacher	17-01-18	25-02-18	42	MILD
8	5986	Sagunthala	43/f	Teacher	17-01-18	21-01-18	35	MARKED
9	7792	Krishnaveni	59/f	House wife	23-01-18	06-03-18	42	MODERATE
10	7905	Subbuthai	50/f	House wife	23-01-18	12-03-18	48	MARKED
11	8584	Fathima	40/f	House wife	25-01-18	08-03-18	42	MARKED
12	9038	Sherina	57/f	House wife	26-01-18	08-03-18	42	MILD
13	10280	Umayammal	60/f	House wife	30-01-18	12-03-18	42	MARKED
14	10363	mariyammal	45/f	House wife	30-01-18	12-03-18	42	MARKED
15	11323	Ramalingam	54/m	Formar	02-02-18	22-03-18	48	MODERATE
16	12071	Inthira	56/f	House wife	05-02-18	19-03-18	42	MARKED
17	12319	Meera	46/f	Teacher	05-02-18	12-03-18	36	MILD
18	12388	Shanmugasuntharam	55/m	Farmer	05-02-18	19-03-18	42	MARKED
19	13389	Sowntharajan	58/m	Farmer	08-02-18	28-03-18	48	MARKED
20	13480	Sutha	42/f	Teacher	08-02-18	28-03-18	48	MILD

S.NO	PATIENT NAME	AGE/SEX	OP/IP NO	BEFORE TREATMENT		AFTER TREATMENT	
				Right (cm)	Left (cm)	Right(cm)	Left(cm)
1	Palaniyammal	60/f	3358	35	33	31	30
2	Jeyanthi	43/f	113318	38	36	34	33
3	Raja lakshmi	60/f	1194	39	38	33	32
4	Kala	56/f	5669	34	33	30	30
5	Poovaiya	55/m	2942	35	32	33	29
6	Sherina	57/f	9038	36	35	32	31
7	Chendhura paundiyan	58/m	2154	33	32	29	30
8	Valliyammal	48/f	114833	40	39	35	34
9	Iyyam perumal	60/m	114059	32	35	28	27
10	Meera	46/f	12319	31	33	26	28
11	Anaikarai muthu	56/m	548	41	39	38	37
12	Kaliyappan	52/m	46	38	31	36	33
13	Anuthai	52/f	233	39	37	36	33
14	Mariyammal	41/f	380	30	37	28	35
15	Sagunthala	43/f	5986	24	28	22	26
16	Nadarajan	60/m	430	33	30	31.5	28
17	mariyammal	45/f	10363	34	31	33	27
18	Ramalingam	54/m	11323	35	32	31	30
19	Kuruvammal	60/f	1115	37	36	33	30
20	Shanmugasuntharam	55/m	12388	40	38	38	35.5

INFERENCE:

Knee joint swelling is reduced approximately 2-3 cms after treatment.

BLOOD INVESTIGATION BEFORE AND AFTER TREATMENT – IP PATIENT

S.NO	IP.NO	TC		DC										HB		ESR		BLOOD SUGAR				BLOOD UREA		SERUM CHOLESTEROL	
				N		L		E		B		M						F		PP					
		BT	AT	BT	AT	BT	AT	BT	AT	BT	AT	BT	AT	BT	AT	BT	AT	BT	AT	BT	AT	BT	AT	BT	AT
1	2004	7100	7500	66	67	33	31	1	2	0	0	0	0	13.5	13.7	28	19	99	98	130	133	29	22	159	149
2	2115	7300	7600	59	61	37	36	4	3	0	0	0	0	12.2	12.4	27	20	86	90	132	135	37	34	186	172
3	2154	7600	7400	64	62	33	36	3	2	0	0	0	0	11.8	13.6	15	10	87	90	126	125	28	27	185	176
4	2942	7700	7800	65	64	31	32	4	4	0	0	0	0	9.6	10.1	34	25	80	82	130	132	36	22	221	201
5	3094	7400	7600	71	69	24	28	3	3	0	0	0	0	12.2	12.4	11	99	88	85	132	136	29	25	196	185
6	3285	7900	7700	59	61	36	34	5	5	0	0	0	0	12.2	12.4	19	136	89	87	139	140	29	22	199	187
7	3358	6700	6900	64	62	33	36	3	2	0	0	0	0	9.5	9.9	11	136	79	85	127	128	34	29	179	177
8	46	8100	8500	69	69	28	29	3	2	0	0	0	0	12.8	12.9	32	21	89	88	130	138	35	32	139	165
9	233	8300	8400	64	62	33	36	3	2	0	0	0	0	11.8	11.9	25	11	90	88	136	138	34	29	179	149
10	380	7100	7300	69	67	28	31	3	2	0	0	0	0	12.2	12.4	19	11	87	90	120	130	29	22	159	149
11	383	7700	7800	70	70	26	25	4	5	0	0	0	0	10.9	11.1	30	19	86	88	127	139	42	37	165	157
12	389	7000	7200	59	61	37	36	4	3	0	0	0	0	12.2	12.4	19	11	83	87	130	136	22	19	196	187
13	430	7800	8000	63	65	35	34	2	1	0	0	0	0	12.2	12.4	19	11	79	77	125	126	22	19	186	174
14	533	7400	7500	64	63	32	34	4	3	0	0	0	0	9.5	9.9	34	28	89	85	123	138	34	29	179	165
15	548	6300	6500	71	69	24	28	3	3	0	0	0	0	13.5	13.7	28	19	79	88	130	134	29	22	159	149
16	838	7100	7300	59	61	36	34	5	5	0	0	0	0	12.5	12.7	25	19	89	87	132	137	29	25	196	185
17	1045	6700	6900	64	62	33	36	3	2	0	0	0	0	11.8	11.9	25	20	95	92	129	134	29	22	199	187
18	1073	7500	7700	59	61	36	34	5	5	0	0	0	0	12.5	12.7	24	23	98	96	130	133	34	29	179	177
19	1115	7200	7500	62	64	32	34	6	2	0	0	0	0	13.5	13.6	31	23	82	90	135	140	37	31	167	157
20	1194	6800	7000	61	62	34	34	5	4	0	0	0	0	11.8	12.2	26	18	81	88	126	130	19	15	194	188

BLOOD INVESTIGATION BEFORE AND AFTER TREATMENT – OP PATIENT

S.NO	OP.NO	TC		DC										HB		ESR		BLOOD SUGAR				BLOOD UREA		SERUM CHOLESTEROL	
				N		L		E		B		M						F		PP					
		BT	AT	BT	AT	BT	AT	BT	AT	BT	AT	BT	AT	BT	AT	BT	AT	BT	AT	BT	AT	BT	AT	BT	AT
1	110149	7500	8100	64	67	29	29	7	4	0	0	0	0	12.1	12.4	15	10	97	92	149	135	28	27	185	176
2	113318	7400	7600	72	69	25	28	3	3	0	0	0	0	13.1	13	22	19	124	118	168	155	40	31	208	201
3	114833	7200	7500	64	63	32	34	4	3	0	0	0	0	9.5	9.9	28	19	99	90	149	132	29	22	159	149
4	114059	7800	7400	65	64	31	32	4	4	0	0	0	0	9.6	10.1	34	25	108	102	189	172	36	22	221	201
5	1759	7500	7600	59	61	36	34	5	5	0	0	0	0	12.5	12.7	25	20	96	92	176	140	34	29	179	177
6	5669	7700	7300	62	64	32	34	6	2	0	0	0	0	13.5	13.6	31	23	122	108	154	146	37	31	167	157
7	5810	6900	6700	59	61	37	36	4	3	0	0	0	0	12.2	12.4	19	11	136	127	179	161	22	19	196	187
8	5986	8200	7900	69	69	28	29	3	2	0	0	0	0	12.8	12.9	32	21	142	128	165	148	35	32	139	165
9	7792	8000	8100	64	62	33	36	3	2	0	0	0	0	11.8	11.9	25	11	127	167	156	29	34	29	179	149
10	7905	7300	7100	66	67	33	31	1	2	0	0	0	0	13.5	13.7	28	19	99	90	149	132	29	22	159	149
11	8584	7800	7700	59	61	37	36	4	3	0	0	0	0	12.2	12.4	27	20	106	97	167	165	37	34	186	172
12	9038	7100	6900	64	62	33	36	3	2	0	0	0	0	11.8	13.6	15	10	97	92	149	135	28	27	185	176
13	10280	8800	8400	63	65	35	34	2	1	0	0	0	0	12.2	12.4	19	11	129	117	179	161	22	19	186	174
14	10363	8400	7900	64	63	32	34	4	3	0	0	0	0	9.5	9.9	34	28	89	85	149	140	34	29	179	165
15	11323	7300	7100	71	69	24	28	3	3	0	0	0	0	13.5	13.7	28	19	99	90	149	132	29	22	159	149
16	12071	7200	7500	59	61	36	34	5	5	0	0	0	0	12.5	12.7	25	19	136	127	167	156	29	25	196	185
17	12319	6900	6700	64	62	33	36	3	2	0	0	0	0	11.8	11.9	25	20	96	92	176	168	29	22	199	187
18	12388	7800	7500	69	67	28	31	3	2	0	0	0	0	12.2	12.4	19	11	99	90	149	132	29	22	159	149
19	13389	9200	9000	70	70	26	25	4	5	0	0	0	0	10.9	11.1	30	19	136	128	159	139	42	37	165	157
20	13480	6700	6900	61	62	34	34	5	4	0	0	0	0	11.8	12.2	26	18	121	118	172	159	19	15	194	188

URINE EXAMINATION BEFORE & AFTER TREATMENT – OUT PATIENTS

S.no	Op.no	Before treatment			After treatment		
		Albumin	Sugar	Deposit	Albumin	Sugar	Deposit
1	110149	NIL	NIL	NAD	NIL	NIL	NAD
2	113318	NIL	NIL	NAD	NIL	NIL	NAD
3	114833	NIL	NIL	NAD	NIL	NIL	NAD
4	114059	TRACE	NIL	1-2 PUS CELLS	NIL	NIL	NAD
5	1759	NIL	NIL	NAD	NIL	NIL	NAD
6	5669	NIL	NIL	NAD	NIL	NIL	NAD
7	5810	NIL	NIL	NAD	NIL	NIL	NAD
8	5986	NIL	NIL	NAD	NIL	NIL	NAD
9	7792	NIL	NIL	NAD	NIL	NIL	NAD
10	7905	NIL	NIL	NAD	NIL	NIL	NAD
11	8584	NIL	NIL	NAD	NIL	NIL	NAD
12	9038	NIL	NIL	NAD	NIL	NIL	NAD
13	10280	NIL	NIL	NAD	NIL	NIL	NAD
14	10363	NIL	NIL	NAD	NIL	NIL	NAD
15	11323	NIL	NIL	NAD	NIL	NIL	NAD
16	12071	TRACE	NIL	1-3 PUS CELLS	NIL	NIL	NAD
17	12319	NIL	NIL	NAD	NIL	NIL	NAD
18	12388	NIL	NIL	NAD	NIL	NIL	NAD

19	13389	NIL	NIL	NAD	NIL	NIL	NAD
20	13480	NIL	NIL	NAD	NIL	NIL	NAD